

# The CycleSafe Network Active Travel Infrastructure Project

**CONSULTATIVE DRAFT**  
Prepared by The CycleSafe Network  
Steering Committee





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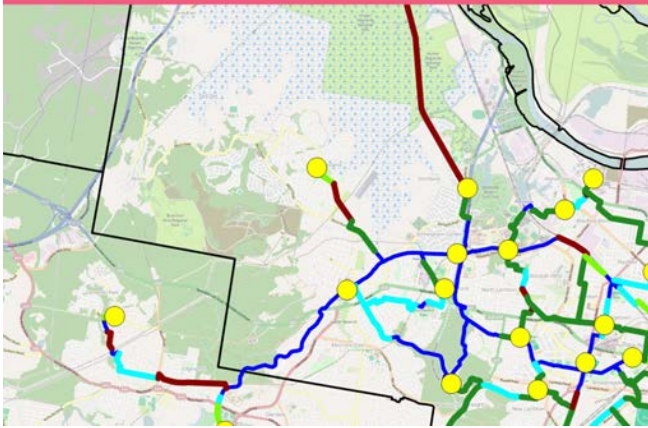
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# ABBREVIATIONS, ACRONYMS AND TERMINOLOGIES



|              |   |
|--------------|---|
| <b>BNSW</b>  | Bicycle New South Wales                               |
| <b>CBA</b>   | Cost Benefit Analysis                                 |
| <b>CSN</b>   | CycleSafe Network                                     |
| <b>DCP</b>   | Development Control Plan                              |
| <b>DIRD</b>  | Department of Infrastructure and Regional Development |
| <b>DOP</b>   | Department of Planning                                |
| <b>ETFs</b>  | End of Trip Facilities                                |
| <b>HF</b>    | Heart Foundation                                      |
| <b>HMA</b>   | Hunter Metropolitan Area                              |
| <b>LGA</b>   | Local Government Area                                 |
| <b>LMCC</b>  | Lake Macquarie City Council                           |
| <b>NCC</b>   | Newcastle City Council                                |
| <b>RMS</b>   | Roads and Maritime Services                           |
| <b>TfNSW</b> | Transport for NSW                                     |
| <b>NGO</b>   | Non-Government Organisation                           |
| <b>STA</b>   | State Transit Authority                               |

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# EXECUTIVE SUMMARY



The Cyclesafe Network (CSN) is a system of family safe, easily navigated and usefully connected cycling, walking and shared paths across the Newcastle and Lake Macquarie local government areas. The proposal is to connect 90km of existing paths with 140km of new construction to deliver an active transport network which will encourage locals to cycle or walk every day to work, school, university, shops and other locations.

The aim of the network is to make walking and cycling for short trips – less than 2km for walking and less than 10 km for cycling – a viable alternative to car travel. With new State Government plans to increase the population of 'Hunter City', it is essential that active transport infrastructure be built to accommodate increased travel demands.

In addition, the CSN will also deliver health benefits to the population of the Hunter region by increasing physical activity as part of everyday life. This will help achieve the State Premier's goal of reducing childhood obesity by 5% over 10 years.

This document puts forward a proposal for the CSN to be developed as a co-ordinated transport infrastructure project, to be delivered in 3 phases over 7 to 10 years. In order to achieve this the CSN Project needs to be tasked to a relevant Hunter based Development Authority with a commitment to funding to completion. We believe this is now achievable due to strong community, business and local government support, a source of funding from the lease of the Port of Newcastle and overwhelming evidence of the benefits which can be achieved from implementation of the Project.

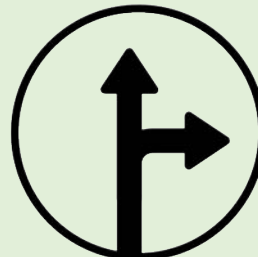
## PRINCIPLES



**Family Safe**



**Connectivity**



**Easy Way Finding**



**World Class Infrastructure Amenity**

## INFRASTRUCTURE DESIGNS

**Shared path**

**Off-road shared path**

**Bike boulevard**

**Separated cycle lane on roads**



## OUR AREA

**342 605**

Total Population

**63 220**

Total 5 to 19 year olds

Newcastle City Council

**148 531**

Residents

**794**

Residents/km<sup>2</sup>

Lake Macquarie City Council

**186 006**

Residents

**240**

Residents/km<sup>2</sup>

## OUR HEALTH

**32%**

Of our children are obese

**63%**

Of us are overweight or obese

## OUR TRAVEL

**88%**

Of households own at least 1 car

**68%**

Of all travel to work journeys are single car drivers

**1.1%**

Of the population cycles to work

**2.6%**

Of the population walks to work

**21%**

↑ in bicycle sales since 2009

**7%**

↓ in child bicycle sales since 2009

Bicycles outsold cars for the **15th year running** with over **1.3 million** bicycles sold in the 2013-14 year in Australia

## OUR ENVIRONMENT

**3 out of 6**

Air monitoring sites showed the annual average of air pollution above accepted advisory standard

### *Alignment with Government policy*

The need to increase physical activity and encourage people to use active transport for short trips rather than personal cars is supported by policy at the Australian Commonwealth, NSW State and Local Government levels. Both Newcastle City Council and Lake Macquarie City Council have cycling and walking strategies which outline future cycling/walking/shared path development. The proposed Phase 1 of the CSN includes paths which are 'shovel ready' – where design and planning is near complete and the project only requires a commitment of funding for it to proceed.

The NSW Government has a commitment to cycling and walking which is included in key strategic documents, including the *Draft Hunter Regional Plan*, the *Draft Plan for Growing Hunter City*, the *NSW Transport Master Plan* and the *Hunter Transport Plan*.

In the NSW State Plan 2021, a goal of a 5% increase in cycling and a 5% increase in walking was set. We have set this as the indicator for the CSN and have undertaken a cost benefit analysis on the basis of achieving that figure.

Existing cycling and walking paths in the Newcastle and Lake Macquarie areas have been built with a combination of Commonwealth, State and Local Government funds. Much of this has been achieved in small projects funded by local rates augmented with small grants from sources such as the NSW Roads and Maritime Walking and Cycling Programs.

This piecemeal approach has resulted in long delays with disconnected sections of cycleways which require people to move between safe cycling paths and busy roads. This is a disincentive to everyday cycling especially for children and their parents, inexperienced cyclists, the elderly and people with limited mobility. The 15km Fernleigh Track, which is now a popular and well-used walking and cycling path, took 12 years to build. This could have been more efficiently and economically completed had funding been available from the start.

We propose that the CSN be developed and delivered as a transport infrastructure project, with funds committed from the lease of the Port of Newcastle. The NSW Premier Mike Baird was reported in May 2014 as saying that the lease would see \$1.5 billion flow into infrastructure projects. Of that \$340 million would be allocated to the revitalisation of Newcastle.

We propose that further funding from the lease be committed to delivering the CSN - to honour the workers who made the industries which built the Port and for the long term benefit of current and future workers.

### *Why Newcastle and Lake Macquarie*

There is strong community support for active travel – especially cycling and walking – across the Newcastle and Lake Macquarie areas. The area has a long history of workers cycling, from steelworkers in the 1940s and 1950s to today where the proportion of trips made by bike is double the state average.

The gentle topography and mild climate make cycling and walking attractive if safe infrastructure is available. In suburbs close to the Throsby Creek cycleway, for example, 6% of trips to work are by cycling compared to 2% across the Newcastle LGA. Data indicates that many trips in cars could be converted to cycling or walking – 40% of trips are less than 2km and 80% are less than 10km.

The work already done to develop the CycleSafe Network Project proposal has been a collaboration over many years between individuals, community organisations, local businesses, local councils and the University of Newcastle. These stakeholders are committed to continuing their support, ensuring that the CSN will be well used.

### *Cost benefit analysis of CSN*

Preliminary estimates indicate that the CSN could be delivered for \$164 million over 8 years as:

Phase 1 – 2016-2019 – 26 km - \$31 million

Phase 2 – 2018-2022 – 55 km - \$73.3 million

Phase 3 – 2020-2024 - 42 km – \$55.9 million

Using the Bike Facility Tool developed by Transport for NSW we have calculated monetised benefits which could be achieved by a 5% increase in cycling use by residents in the area covered by the CSN, using 4 different scenarios.

Scenario 1: If 5% of all the population within the CSN catchment used cycling for trips less than 10km the total monetised benefit would be \$306 million per year, paying back the cost of building the CSN in 6.4 months

Scenario 2: If 5% of employed people aged 15 years and over used cycling for travel to and from work (less than 10km away), the total monetised benefit would be \$50 million per year, paying back the cost of building the CSN in 3.3 years.

Scenario 3: If 5% of children aged 5 to 19 years travelled to school (up to 2km for 5 to 9 year olds, up to 5 km for 10 to 19 year olds) the total monetised benefit would be \$9 million per year, paying back the cost of building the CSN in 18.5 years

Scenario 4: If 5% of all the population within the Phase 1 catchment used cycling for trips less than 10km the total monetised benefit would be \$170 million per year, paying back the cost of building the CSN in 11.52 months.

### *Future research potential*

It is difficult to undertake cost benefit analysis for cycling and walking infrastructure in Australia as there are significant gaps in the data available. A critique undertaken by researchers from the University of Newcastle Faculty of Business of currently used guidelines and methods for analysis of active transport identified significant gaps and a variety of assumptions which impact on results.

The collaboration of the University of Newcastle and the Tom Farrell Institute for the Environment in this project provides the ideal opportunity for research to be undertaken alongside the building of the CSN to fill those gaps. This will allow more substantial data to be available to inform future active transport infrastructure projects across NSW.

**An average of \$1.33 million per kilometre.**

**Out of 125 regional schools, 114 are within 1000m and 93 are within 500m.**

# INTRODUCTION



The proposed CycleSafe Network (CSN) is a system of family safe, easy to navigate, connected cycling, walking and shared paths across the Newcastle and Lake Macquarie regions. The CSN has been developed by local individuals, groups and organisations, collaborating to build a vision for an effective and efficient active transport network which will allow local residents and visitors to choose cycling and walking for getting to work, school, university, shops and recreation.

Newcastle and Lake Macquarie City Councils have already built many cycling and shared paths. The proposed CSN, based on the councils' long term cycling strategies, will link the 90km of existing paths with an additional 140km of new paths delivering 230km of world class, active travel infrastructure. This can be a model for other regions in Australia to follow.

The proposal for the CSN has been extensively researched and developed over many years by members of the Newcastle and Lake Macquarie community to produce a feasible plan, ready for formal development by State and Local Government planning authorities. The proposal includes GIS

mapping of path routes, preliminary costings; an appraisal of the benefits to the community in both economic and health terms; and a research framework for evaluation.

This report brings together the data that has been gathered to date to provide a preliminary business case to support funding for the CSN in its entirety as a Regional Infrastructure Project. Newcastle and the Hunter Region are undergoing significant renewal at this time as the region repositions itself for future economic and population growth.

The CSN Steering Committee presents this report as a contribution to the current consultation on the NSW Department of Planning and Environment's draft plans for the Hunter Region.

This report assesses the costs and potential benefits of the CSN across a range of parameters, including its potential contribution to two NSW Government goals<sup>1</sup>:

- 5% reduction in obesity in children over 10 years, and
- 5% cycling mode shift<sup>2</sup>

In NSW, cost benefit analysis for cycling and walking infrastructure is less well developed than that for roads or other forms of transport. This report has used the best available data to undertake analysis for the area covered by the proposed CSN. In addition, we have supplied additional comment, based on research commissioned from the University of Newcastle, on cycling related gaps in current assessment methodology used by the NSW Government to assess transport infrastructure.

The collaboration and support of the University of Newcastle's Faculty of Business, Hunter Medical Research Institute, and The Tom Farrell Institute of the Environment for this proposal provides a rare opportunity to include research projects into the development and building of the CSN. This means better cost benefit analyses can be developed for NSW with other regions able to benefit from the lessons and outcomes learned here. The last section of this report proposes three research projects to close the gaps in knowledge and act as a pilot project for active travel integration which can be scaled up not only for NSW but across Australia.

The *Draft Plan for Growing Hunter City* forecasts that the population in the area from Toronto and Swansea in the south up to Raymond Terrace in the

north will grow from its current 430,000 residents to around 750,000 in the next 40 to 50 years.

Hunter City has the opportunity to avoid repeating the mistakes of metropolitan Sydney's unplanned expansion preventing traffic congestion and long commute times. By mandating active transport as a requirement of new transport infrastructure planning, Newcastle and Lake Macquarie can build the area's economic future while maintaining its attractiveness as a great place to live. The combination of attractive, reasonably priced urban areas for people of all ages to live, and short comfortable commute times to support a healthy family life will be a powerful attraction for a regional Asia Pacific City.

Transport Infrastructure is expensive and needs adequate funding to ensure that projects are completed efficiently and effectively. Cycling and walking paths are traditionally developed piecemeal with only small levels of funding made available to local councils. This leads to a proliferation of short paths which are disconnected and dangerous, discouraging people from using them as a transport choice to their school, place of work or local shopping areas. By considering the cycling and walking needs of residents as part of transport planning for the area, additional links or paths can be built strategically providing a viable alternative to car travel for short trips.

The lease of the Port of Newcastle has made funding available for local infrastructure improvements and the NSW Premier, Mike Baird, has committed to the allocation of \$340 million from the lease of the Port to infrastructure projects in Newcastle. By committing some of this money to active transport infrastructure, the Premier will not only honour the generations of bike riding Port workers who grew the wealth of Newcastle and the Hunter region in the 1940s and 1950s but will ensure that future generations grow healthy and wealthy by incorporating active transport into their everyday life.

The CSN covers an area where 342,605 people live and there are 63,220 school-aged children. It has been designed for 80% of the population to be within 300m of a cycling or shared path. This is an infrastructure proposal which benefits the whole community, now and in the future.

## 2.1 Acknowledgements

The CycleSafe Network is an Incorporated Association whose members represent a wide range of community groups, residents, businesses and industry groups in the Hunter area.

We came together with the aim to support and assist the councils of Newcastle and Lake Macquarie to make the case for funding better cycling infrastructure in their areas. Both councils have developed forward thinking cycling strategies for their communities and the skills and expertise of the CSN group has been able to increase awareness of best practice world standards that will be needed to achieve these goals.

The CycleSafe Network organising group and its supporters have over 200 combined years of experience as physicians, public health officials, health promotion professionals, mining engineers, business owners, principals, disability advocates, and local government. They have donated their time and energy to research and prepare this document in order to make their community a healthier place to live, a more prosperous place to bring up a family, and a place where the health and economic future of their children is assured. They have committed to continue to work to see this happen.

Many people have contributed to the development of the CSN. The individuals mentioned below have contributed substantially to the research and writing of this report.

It should be noted that no one who worked on the CSN report or is part of the CSN Steering Committee received funding from or is a paid lobbyist for any company that may tender for the construction of the CycleSafe Network.

*Megan Sharkey* is the main author of the report and a member of the Steering Committee. Since, November 2014, Ms Sharkey has been instrumental in organising the CSN funding campaign and developing the content of the consultative draft.

*Dr Benjamin Ewald* is a founding member of the CSN, a member of NCM, HMRI researcher, and a GP. His contributions on health and physical activity, as well as his local knowledge have been invaluable. Doctor Ewald contributed to the health section, treatment designs, research section and economic section.

*Sam Reich* is a founding member of the CSN and a member of NCM. Sam performed all GIS tasks required for the CycleSafe Network and this report.

*Peter Lee* is a founding member of the CSN the president of NCM and contributed to the LMCC sections and Charlestown to Coast.

*Deborah Moore* is the Heart Foundation representative on the CSN Steering Committee.

*Sarah Ladyman* is the communications manager for the CSN and contributed to the supporters' section and graphics.

*Dr Tim Roberts (Director, the Tom Farrell Institute)* has provided guidance and key contacts. The Tom Farrell Institute for the Environment will support the environmental sections of this report with the final report to be released late in 2016.

*Dr Simon Deeming and HMRI* have provided support and guidance on potential research possible for the CSN since 2015. They contributed to the research proposal around the CSN and are currently developing research surveys for a baseline analysis. Their contribution is greatly appreciated.

*Dr Kala Saravanamuthu* is a Professor in the Faculty of Business specialising in sustainable accounting and risk analysis. Performing a critical review of active travel cost benefit analysis, the critique allows for a way forward to strengthen the way to perform cost benefit analyses. The testing of the TfNSW tool and guidance on research possible regarding monetary valuation has been invaluable.

*Robyn Charlton* is the research assistant who has worked with Dr Saravanamuthu researching the reports, finding case studies, and painstakingly tracking down every piece of data for the critique. Her experience from over 20 years of environmental, quantitative, and qualitative analysis in complex systems continually offered new questions and uncovered new information. We hope she sticks around.

*Ming Yong* was the graphic designer for the report. Ming is also studying medicine to be a doctor and is interested in public health. We were lucky he was able to assist with this report and we wish him the best in his studies.

*Daniel Endicott* (often known as the 'bike man') As a mechanical engineer, bike mechanic, and lifetime cycling advocate, his knowledge of road rules,

people's perceptions (last year he sold 850+ refurbished bikes and had over 2000 people visit him for repairs), and safety has been incredibly useful. Dan contributed to the road rules and safety sections.

*Drs Sarah Sharkey and Christiana Hayward* recently travelled to Europe providing the report with photographs.

*Sara Stace* contributed many of the photographs in this report and provided feedback along our journey. Her photographic contributions are noted in the table of contents.

*Bernard Hockings* is a founding member and contributed many of the photographs in this report.

### *Council Support*

*Newcastle City Council* have been instrumental in preparing this report. The original CSN proposal builds off their cycleway strategy. The NCC cycling working party have helped to transition to safer cycleway standards. Without NCC staff support we could not have prepared realistic costings for the numbers prepared in this report or fully understand planning and design constraints. In addition, being able to provide us with feedback on our ideas, understand local government operations, and receive information increased the quality of this report. We are extremely grateful to the Infrastructure Division staff, and staff members of the working party.

*Lake Macquarie City Council* staff have worked with the CSN steering committee over the last year to gauge an understanding of LMCC's capacity to deliver the CSN. Information regarding CSN segments in LMCC has been distributed by council staff. LMCC councillors recently passed a motion supporting the CSN. We look forward to building on this.

For the many others who have provided information, support or advice, thank you.

## 2.2 Building CycleSafe Network Support

Over the last two years, a coalition of community members, local organisations, and the council worked together to build support for the CSN. The CSN originated with Newcastle Cycleways Movement members identifying the need to assist with building safe infrastructure quickly. They developed the conceptual and actual gaps in cyclist safety and infrastructure to support cycling in the LMCC and NCC regions. The concept for enhancing the existing paths and cycleways to become a connected network for transport was presented to councils (with some support but no allocated budget for the desired timeframe) and to broader relevant organisations, including, among others, the University of Newcastle and the Heart Foundation in late 2014 and early 2015. Since then we have been working to formulate and share the proposal.

### Supporters



### Social Media

#### Website / Facebook / Twitter / Instagram

The messaging has been simple and consistent and all related stories and links have reiterated the overarching goal for the CSN – CONNECTED, FAMILY-SAFE, EASY, WORLD-CLASS INFRASTRUCTURE.

[www.csn.org.au](http://www.csn.org.au)

[hello@csn.org.au](mailto:hello@csn.org.au)

Facebook - "CycleSafeNetwork" -

<https://www.facebook.com/CycleSafeNetwork>

Instagram - @CSNActiveTravel

Twitter handle - @CSNActiveTravel

Facebook Demographics: 57% men, 41% women

Post reach in April 2016: 28% women aged 18-34 (highest category)

Mailing list of supporters, interested parties and volunteers: 500 people

# THE CYCLESAFE NETWORK

The CycleSafe Network proposal is for a fully funded, designed and co-ordinated transport infrastructure development project which will construct a 140 kilometre network of cycling and shared paths which integrates into other transport networks in the Newcastle and Lake Macquarie areas. The CSN delivers efficient, sustainable transport which enhances the liveability of neighbouring residential areas and increases social capital in the form of health and social equity benefits. It is envisioned to be built in 3 phases over 7-10 years which will allow for supporting community activity to increase awareness of the benefits of active transport and promote use.

The CSN's design principles aim to make cycling an attractive and feasible mode of travel, with connected, family safe routes, easy way finding and world class infrastructure which all community members would be able to use. It has been designed to be accessible for children, the aged and people with reduced mobility to provide efficient transport for short day-to-day trips to school, university, shopping and work.

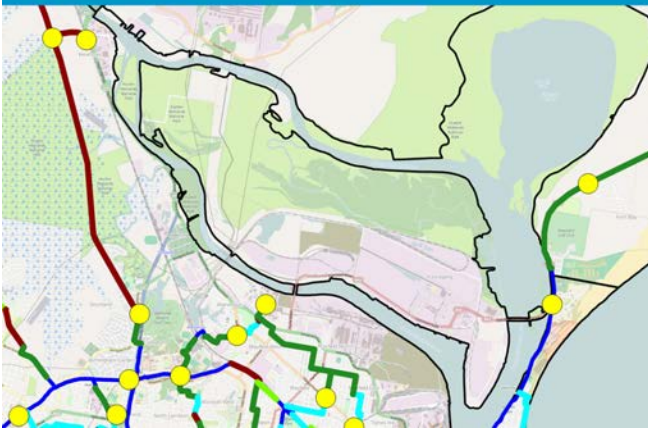


Image 1 School kids crossing pedestrian walkway at Merewether Beach. (Sarah Ladyman)



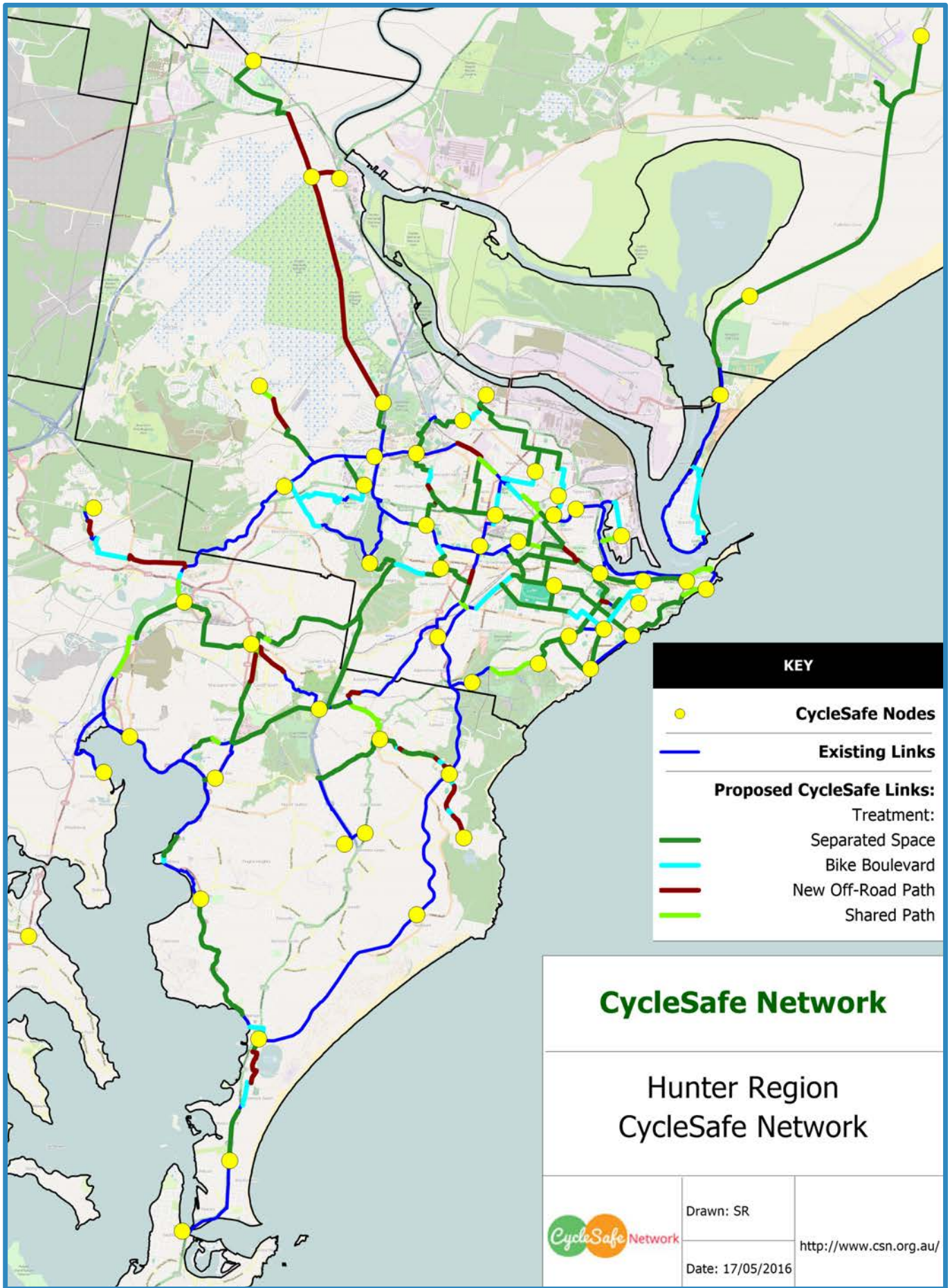
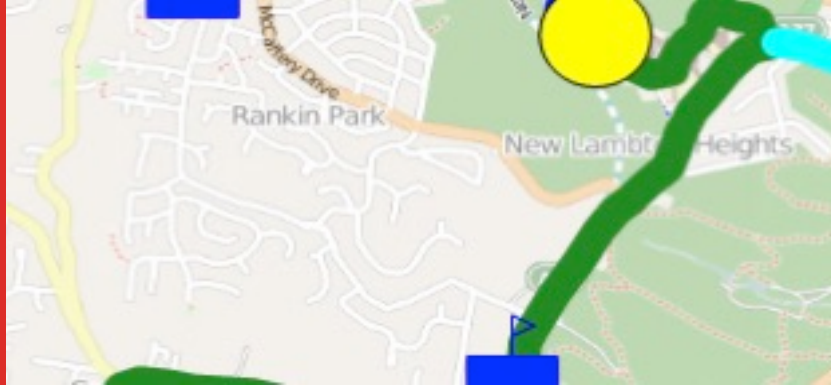


Figure 1. CycleSafe Network Proposed Map

# PRINCIPLES OF THE CYCLESAFE NETWORK



## CONNECTED

Linking everywhere to everywhere

Linking everywhere to everywhere with 140km of cycle paths the network will operate along the current road network or in a grid like patterns similar to how cars would travel. The grid network maximizes permeability and caters for diverse transport needs. A high quality motorway would not suddenly turn into a single lane dirt road – the same car connectivity design principles should apply to active travel infrastructure, such as the shared and separated pathways in the network.

The CSN routes are strategically located to enable the majority of the region's residents to be within a few hundred metres (a two minute ride) of family-safe paths. The network will connect six of the nine strategic centres identified in the *Draft Plan for Growing Hunter City 2015*: Broadmeadow, Charlestown, Glendale, John Hunter Hospital, Newcastle CBD, the University of Newcastle and many more local shops, schools, hospitals and employment centres.



## FAMILY SAFE

CSN4ALL

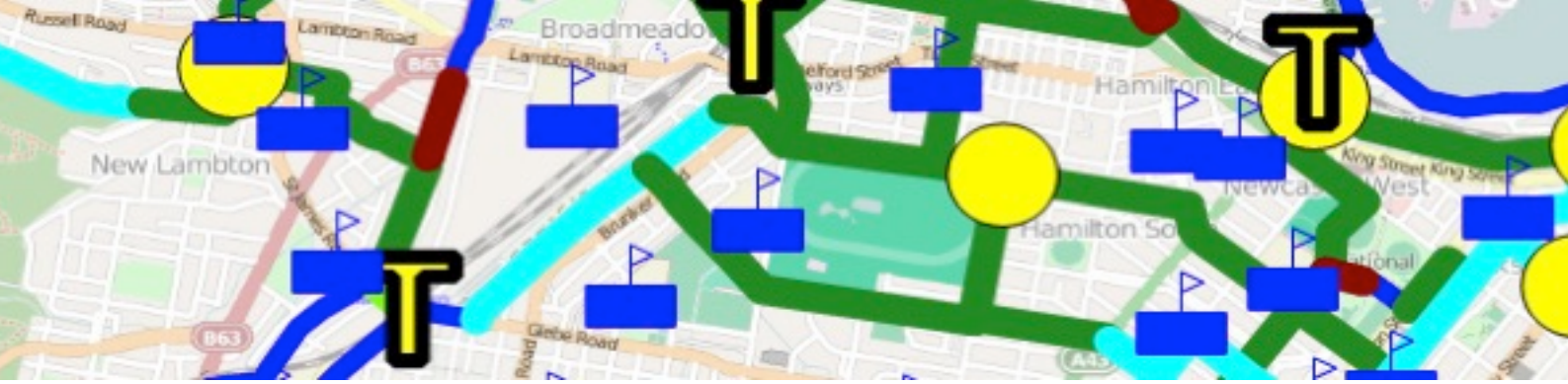
Connecting destinations with a uniform level of safety along the entire path so that even a primary school age child can use it.

Cycleways will not end abruptly, leaving riders in difficult or dangerous traffic situations that they may not have skills for, or without a safe option to complete their journey. Network sections should be separated from vehicles by a physical barrier, use a mixed traffic design on very low volume 30km/hr streets like a bike boulevard, or a shared path where appropriate and when required.

Everyone should be able to travel actively a few times a week and receive health, financial and local environmental benefits.



Image 2 Dropping kids off at school in a cargo bike then heading to work. (Sara Stace)



## EASY WAY FINDING

Clear, consistent, and map free



## AMENITY

World Class Infrastructure

Clear and consistent, the CSN enables easy way finding across the network. It should not be necessary to consult a map once you are on the network. Distinctive signs will indicate nearby nodes, which should be in locations familiar to locals, easily identifiable by visitors, or at major intersections of links. Intersections must be constructed so it is obvious where to ride next. The links' design should offer the safest, most direct and cost effective option to connect nodes. Technological developments mean the integration of routes into public transport apps and smart city technology is possible and would enable vision impaired, disabled and other groups to utilise the network effectively.

Direct, attractive paths with end-of-trip facilities and secure parking at public transport interchanges and in businesses can help make cycling and walking a more convenient, enjoyable activity. Where possible, paths should be away from traffic providing clean air and less noise.

A bicycle travels at speeds on average of 10 to 30km/hr and relies on personal effort. These low speeds mean directness is key to attractive paths. If the network offers safety only at the cost of large increases in distance or provides poor quality paths it will not attract users.

Best practice infrastructure design will attract users, future proof Newcastle and provide the best health and economic outcomes.



Image 3 Campbell Street in Sydney shows ideal separated cycleway infrastructure with a bus stop and pedestrian refuge. (Sarah Stace)

Figure 2 Easy way finding signage.

## 4.1 The CSN Active Travel Infrastructure Project

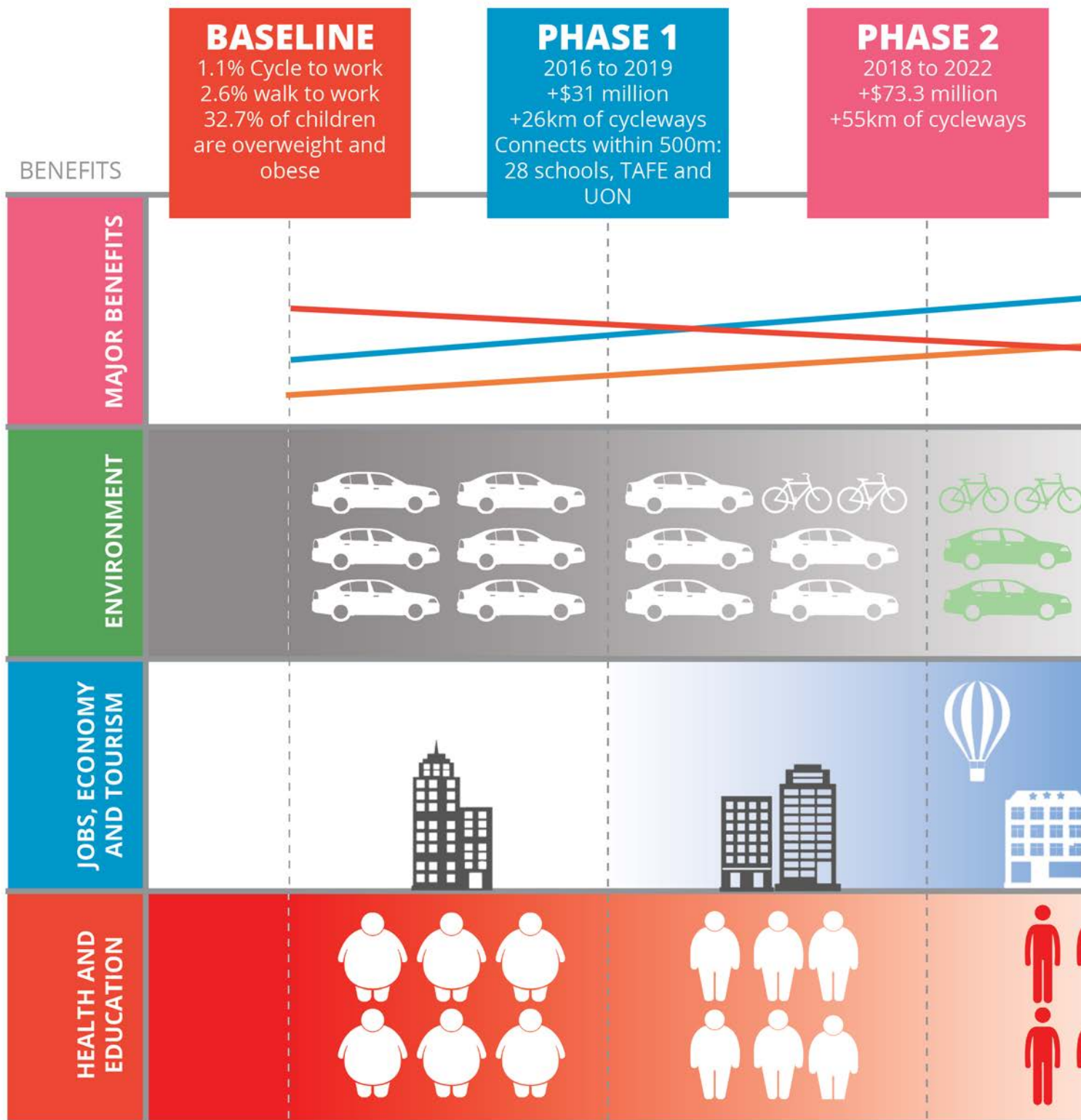
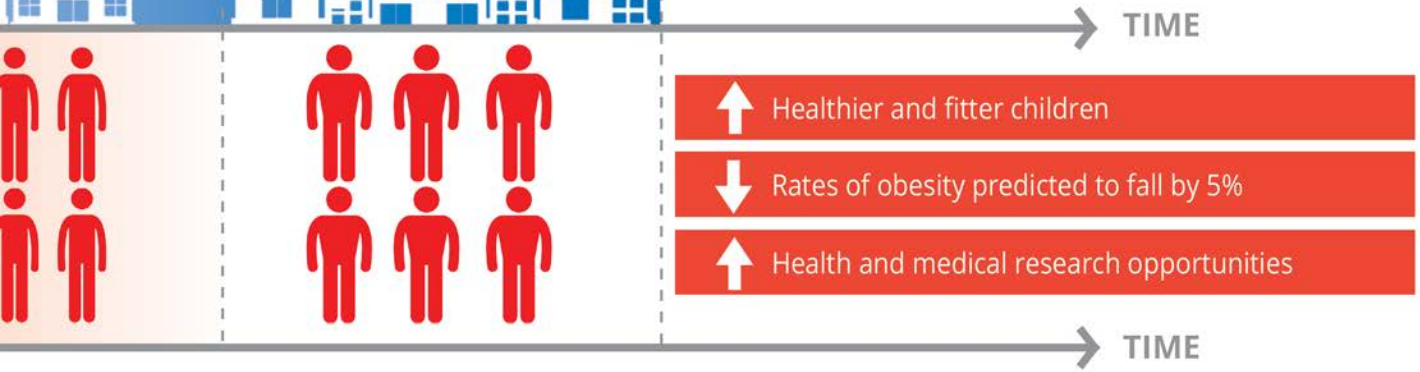
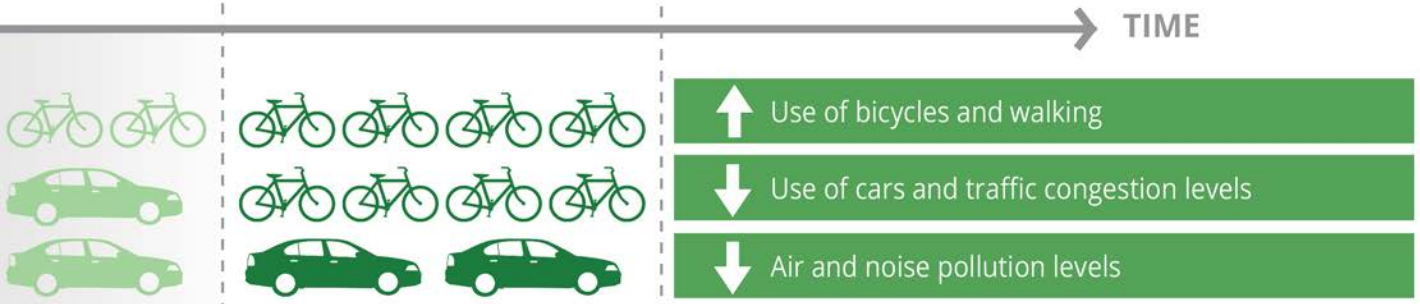


Figure 3 CSN Active Travel Infrastructure Project Snapshot

**PHASE 3**  
2020 to 2024  
+\$55.9 million  
+ 42km of cycleways

**OUTCOME**  
The CycleSafe Network  
\$160 million invested  
140km of cycleways  
\$1.17million/km  
109 schools connected  
within 500m



## 4.2 CSN Project Timeline & Costs

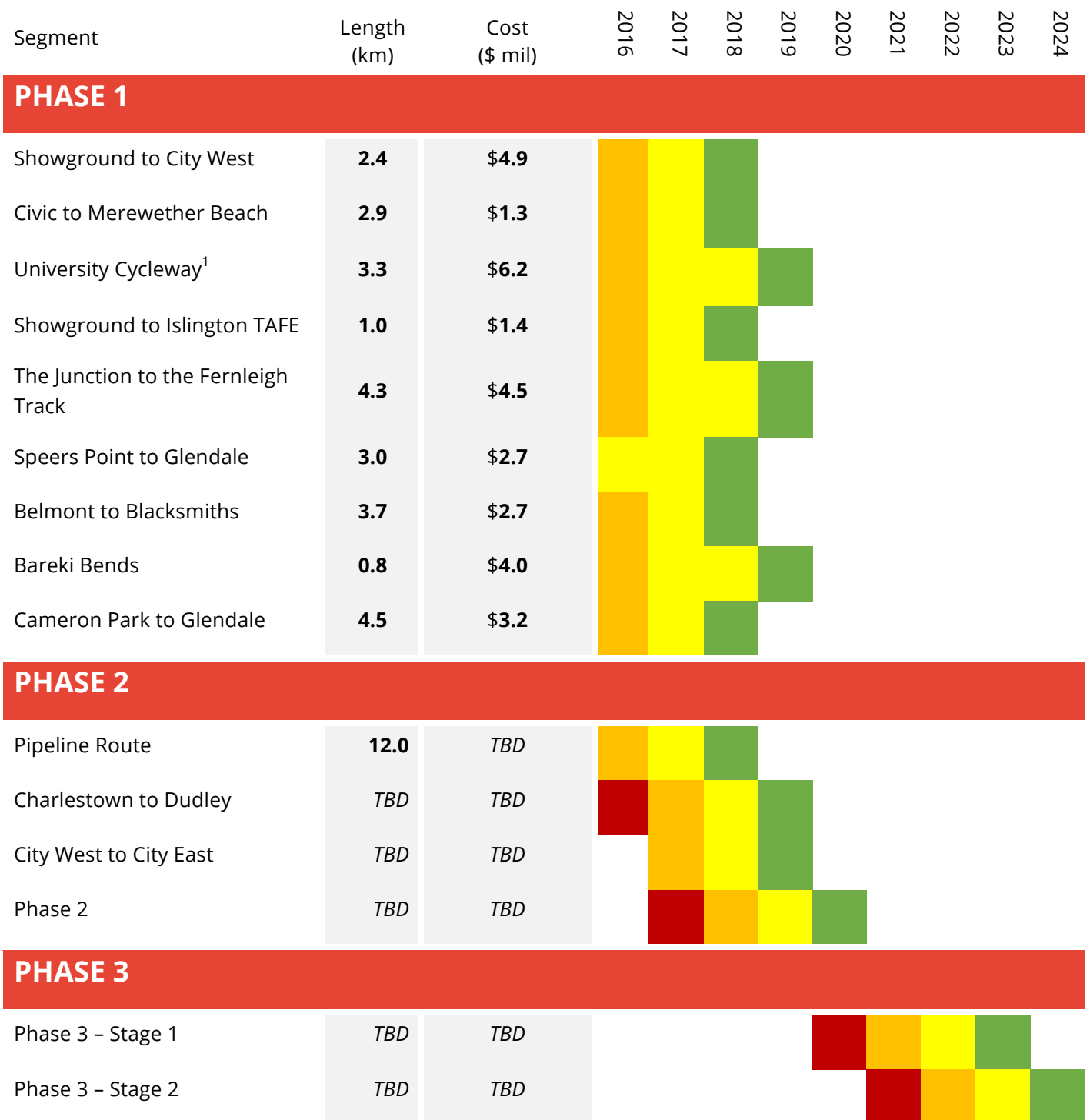


Figure 4 Phase 1 Project Timeline & Costs

<sup>1</sup> Maud Street Underpass is a high unknown and risk.

## 4.3 Pathway Types

### Separated Pathway



Image 4 Campbell Street, Sydney separated pathway. (Sara Stace)

On road separated cycle lane in a single direction located on both sides of the road is the preferred design for high volume traffic. It is protected from fast moving traffic by separation or barriers.

### Bike Boulevards



Image 5 Bike Boulevard Catalina Islands Rendering. (Aaron Keuhn)

Streets on which vehicle speed is restricted to 30km/hr and the road volume is approximately 500 movements per day. Options to achieve this include mid-block road closures, intensive traffic calming, and partial intersection colouring. These are most similar to shared roads used by bikes and low numbers of slow moving motor vehicles.

### Off Road Shared Path



Image 6 The Fernleigh Track. (Bernard Hockings)

Off road shared paths are built on open land away from a road. Three metres is the minimum, but up to 6 metres allows easy passing and reduces conflict between users. Off road shared paths are a delight with clean air, no traffic noise, but are generally unlit (so users need good lights at night). An example would be the Fernleigh Track.

### Shared Paths



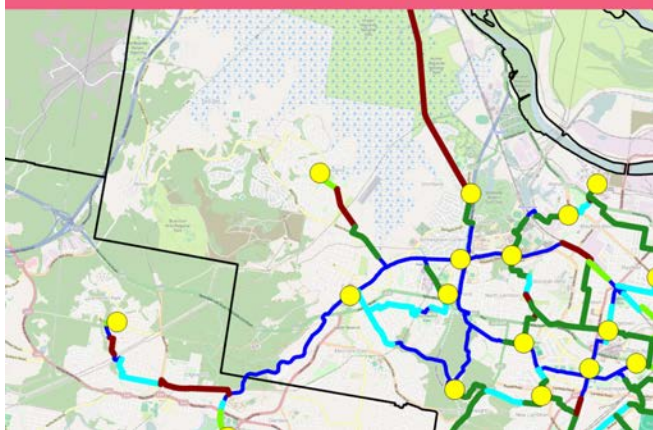
Image 7 Newcastle foreshore shared path. (Bernard Hockings)

Shared paths next to roads are the least desirable treatments as they are simply widened footpaths that cyclists can also legally use. When there is no other way to make a connection and use of a shared path is required, the path can be built with access ramps angled to the direction of travel. The gradient should be shallow (1:16) so cyclists can enter and leave easily and safely.

### Pedestrian Footpaths

Footpaths are essential in linking active travel to other modes. More importantly, intersection connections and curb ramps are particularly important for accessibility of all users. Current footpaths will require improvements and are considered in parts of the network. Footpaths in the city can help create accessible neighbourhood spaces where people can safely gather and children can play, that also link easily to businesses. Standard practice is for one metre wide footpaths but where possible, cycle paths should be separated from pedestrian paths to avoid potential conflict as cycling numbers increase.

# CSN PROJECT PHASE 1 SEGMENT ANALYSIS



## PHASE 1 SNAPSHOT

**26km** Total Length

**12.85km** of Separated Space

**4.67km** of Off Road  
Cycleway/Shared Path

**7km** of Bike Boulevard

**13.72km** of Shared Space

**61** of Total Schools Connected  
within 1 kilometre



## 5.1 Newcastle City Council

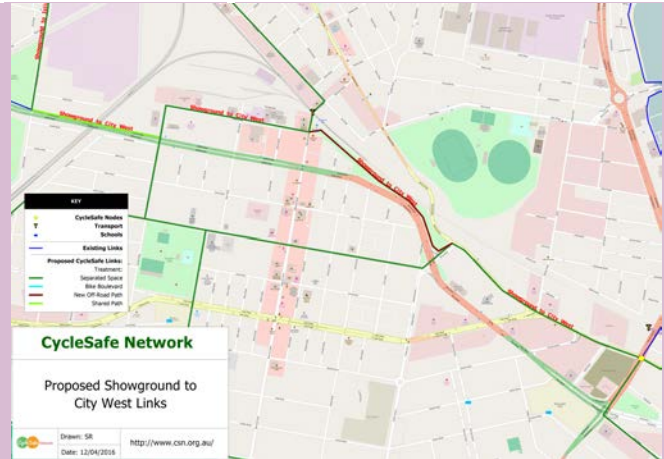
### 1 SHOWGROUND TO CITY WEST

2.415km

\$4 915 000

7 Schools

Detailed design and construction of an east-west cycleway from Broadmeadow to Newcastle West. This is proposed as a combination of shared path, separated on-road and new off-road paths. In addition to the Showground, Hamilton Station and the new Wickham Transport Interchange, the link will service seven schools and the entire shopping strip of Beaumont Street Hamilton within 1000m of the path.



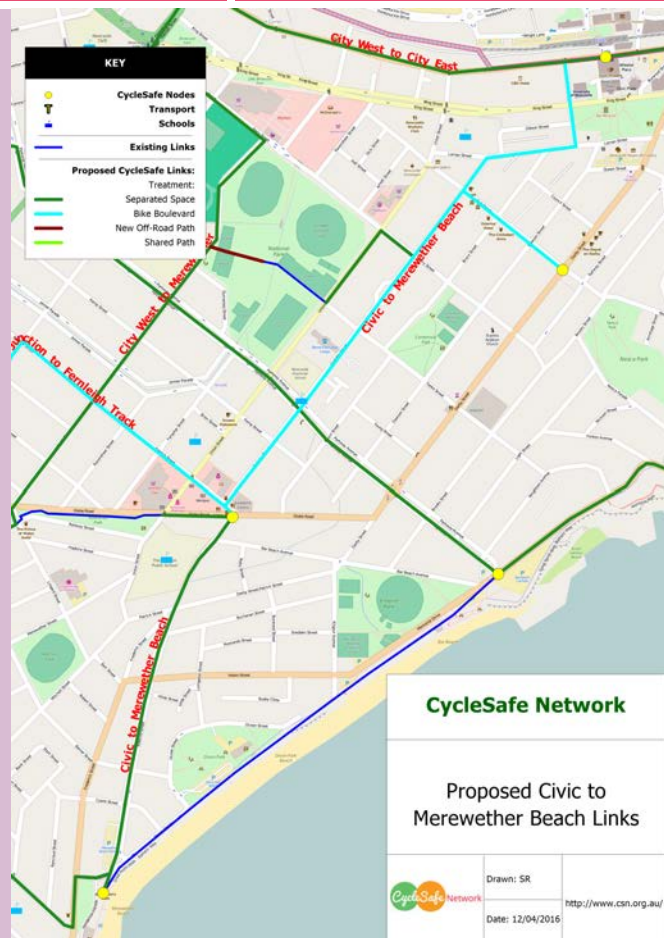
### 2 CIVIC TO MEREWETHER BEACH

2.927km

\$1 300 000

9 Schools

Detailed design and construction of a cycleway from Merewether to the Newcastle City Centre. Proposed treatments are a bike boulevard southward along Auckland, Laman and Corlette Streets to Kenrick Street at The Junction, and separated on-road lanes along Watkins Street to Merewether Beach. The route services the Newcastle CBD and beaches from Bar Beach to Merewether.



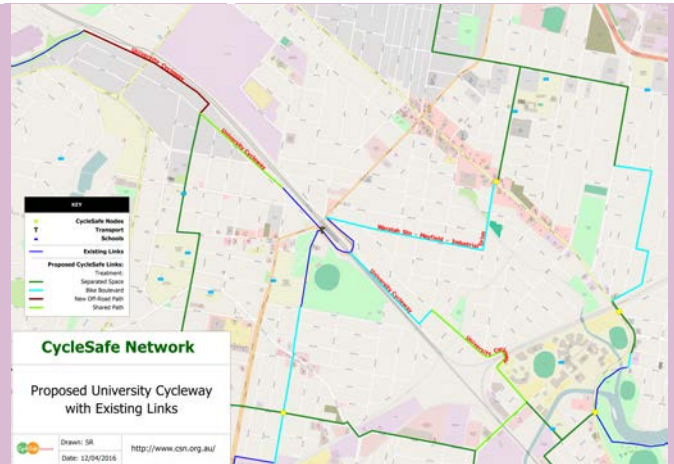
### 3 UNIVERSITY CYCLEWAY

3.255km

\$6 243 000

10 Schools

This important link will connect the two campuses of the University of Newcastle by upgrading the current on-road route to safe separated treatments, and includes the long-sought Maude Street underpass and Scholey Street Bridge upgrades. Islington TAFE, Waratah Railway Station and the Islington Industrial Area are also covered by the route.



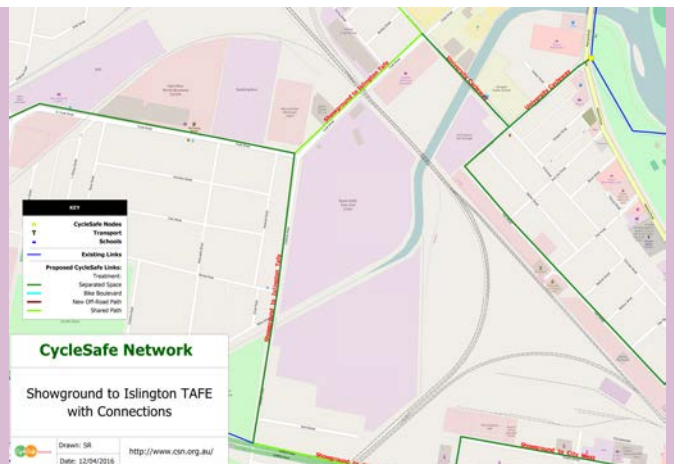
### 4 SHOWGROUNDS TO ISLINGTON TAFE

0.964km

\$1 390 000

5 Schools

This link extends the Showground to City West and University Cycleway through to Islington TAFE, and from there to the existing Throsby Creek track, connecting the Showground and Hunter Stadium to the CBD. This route along Chatham Road and Clyde Street would connect existing major cycleways giving a huge boost to connectivity with only a short segment of new cycleway.



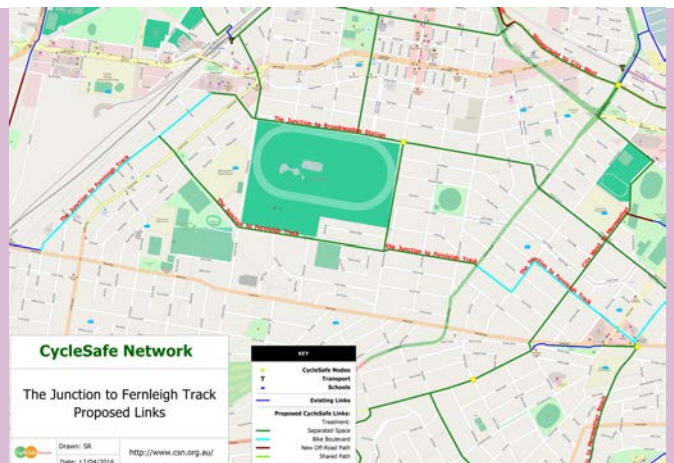
### 5 THE JUNCTION TO FERNLEIGH TRACK

4.291km

\$4 453 973

12 Schools

The well-used alternative to busy Glebe Road for accessing the Fernleigh Track will rely on bike boulevards and separated on-road lanes to take users through The Junction and Hamilton South, alongside Broadmeadow Racecourse to the Adamstown end of the Fernleigh Track. Numerous workplaces will be close to the link, allowing users a safe path from Belmont (and later Swansea) all the way through to Newcastle CBD.



## 5.2 Lake Macquarie City Council

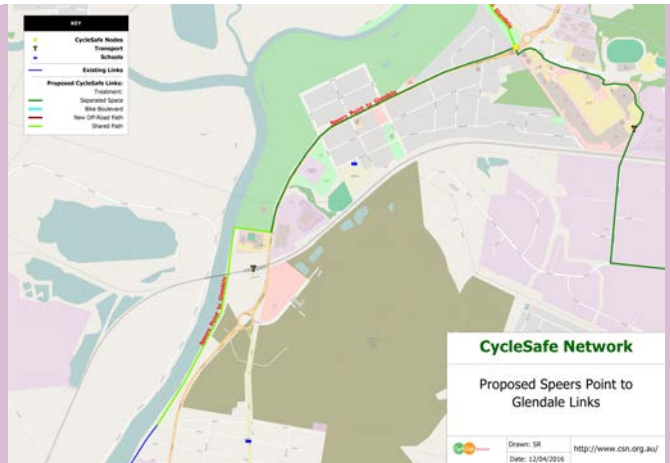
### 6 SPEERS POINT TO GLENDALE

3.040km

\$2 700 000

5 Schools

The Speers Point to Glendale link is a priority for LMCC, as it would join Warners Bay to Glendale (also then to the University of Newcastle at Callaghan, continuing to the East-West Cycleway into Newcastle). It would also provide access from the suburbs of the western side of Lake Macquarie to the Glendale Super Centre, the Glendale TAFE and beyond.



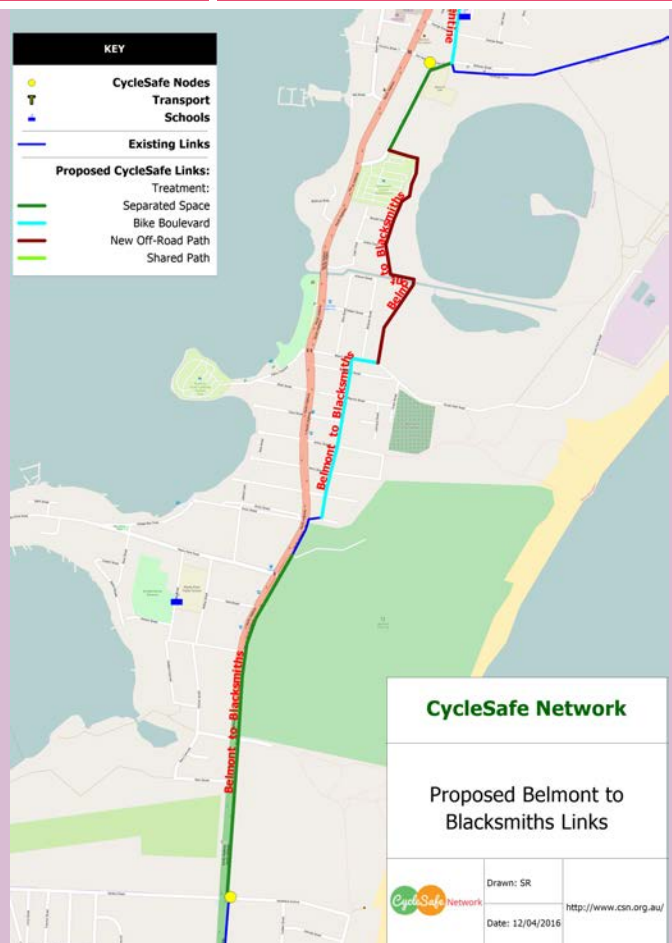
### 7 BELMONT TO BLACKSMITHS (FERNLEIGH TRACK)

3.665km

\$2 700 000

4 Schools

This route connects the southern end of the Fernleigh Track to existing cycleways in Blacksmiths and on to Swansea and Caves Beach. It follows the banks of the Lagoon in the TAFE grounds to the east Spinnakers Leisure Park and crosses Cold Tea Creek on a dedicated new bridge, connecting to a bike boulevard in quiet back streets. It provides access to: Belmont Commercial Centre including Belmont TAFE, Belmont Library, Belmont Golf Club and sporting facilities at Belmont Park, as well as numerous tourist attractions (eg Pelican Airport, Blacksmiths Beach and Holiday parks).



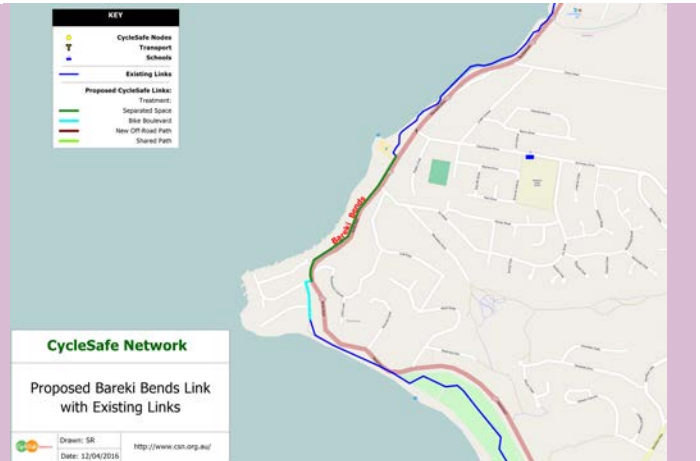
## 8 BAREKI BENDS

0.828km

\$4 000 000

1 Schools

This project is the missing link between Warners Bay foreshore path and the paths through Croudace Bay Park. It is an important commuting link between Belmont and Warners Bay. It is at the base of a substantial spur ridge, which makes any alternative riding route considerably steep and dangerous. Due to this geography the space for projects is challenging and likely to be an expensive per metre rate of cycleway. It also links a skate park, football fields, tennis courts, swimming pool, suburban Valentine and other recreational facilities.



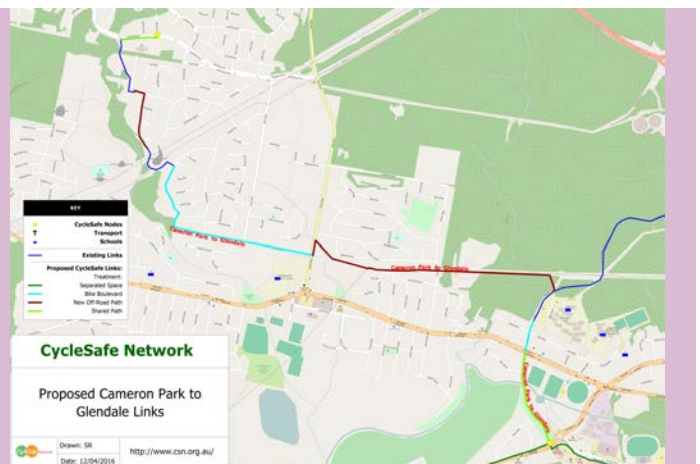
## 9 CAMERON PARK TO GLENDALE

4.533km

\$3 228 337

8 Schools

The proposed CSN route for Glendale to Edgeworth/Cameron Park/West Wallsend is not listed in LMCC strategy, however, the CSN would provide the link through to the existing Tramway Track at Glendale which links to the University network. The current and expected population expansion in these western suburbs underpins the inclusion of this segment of the infrastructure.



# MAKING IT HAPPEN



Because of the size of the project and its need to integrate with transport and other significant community infrastructure across multiple sectors, we propose that the CycleSafe Network is planned, funded and constructed as a single project under the management of a single designated development authority. This model has been successfully used in Sydney and in Newcastle. The Newcastle example is the project specific development authority overseeing the coordination and project management for the revitalisation of the Newcastle CBD and the foreshore.

We propose that the funding be sourced from the proceeds of the lease of Port of Newcastle. The gross proceeds of the sale were \$1.75 billion of which only \$340 million has been committed to be invested in the revitalisation of the Newcastle City Centre. We believe the return on investment for this funding will more than justify the expenditure. The framework for this is presented in this report.

In addition to its direct benefits, the CycleSafe Network is an opportunity to establish planning, tendering and project management procedures which can be used to develop other active transport projects in the future across NSW, and Australia.

Unlike other types of large transport infrastructure projects involving significant levels of funding and co-ordination of stakeholders across sectors and Government, there are very few existing models for designing, tendering and completion of extensive cycling and walking infrastructure in NSW. Existing cycling and walking paths in NSW have largely been developed opportunistically by local government authorities with small and irregular levels of funding (eg the Fernleigh Track). This has resulted in slow progress – the 15km Fernleigh Track took 12 years to complete – leaving cycling paths poorly integrated with other transport.

Building cycling infrastructure as part of a significant road or other transport project (eg. the M7 in Sydney) provides faster and more efficient construction. However, this is not an option for the area covered by the CSN where there are no new motorways planned.

## 6.1 Funding

### 6.1.1 Local Government Funding

Newcastle City Council (NCC) and Lake Macquarie City Council (LMCC) both have documented policies which commit to supporting cycling and walking in their regions and providing cycling, walking and shared paths and cycling-supportive infrastructure. Existing cycling and walking paths in the Newcastle and Lake Macquarie areas have been designed, developed and built by the two local councils using a combination of their own works funding and dedicated project grants from NSW State or Commonwealth Grants schemes. Newcastle City Council has averaged about \$1.5 million a year in cycleway spending over the last 3 years through the support of a rate variation<sup>3</sup>. NCC has also received RMS Active Travel Grants nearly doubling their forecasted spending for 2015/2016 and 2016/2017.

Lake Macquarie City Council has averaged \$2.1 million a year over the last 3 years on cycleway spending. LMCC has also received other grants funding for 2016/2017 and has stated that they will continue to submit applications for active travel infrastructure. Due to the limited funds available, LMCC has begun to stage their projects to fully complete one path before moving onto the next in order to improve connectivity. However, slow progress makes the development of an effective active transport network difficult.

A recent announcement was made to include additional support for cycleway funding (part of the 2016/2017 increase in funds), however it is a re-release of existing proposals.

### 6.1.2 State Government Funding

As previously stated, it is proposed that the CSN be funded from the proceeds from the lease of the Port of Newcastle. The gross proceeds of the sale were \$1.75 billion of which \$340 million has been committed to be invested in revitalisation of the Newcastle City Centre. As detailed elsewhere in this document, we believe an investment of \$164 million to develop and build the CSN will deliver significant benefits to the State of NSW as well as the local community.

NSW Department of Roads and Maritime Services (RMS) currently offers Active Travel Grants to councils to support the building of new infrastructure, as well as information, education and behaviour change programs which promote walking

and cycling. Funding could be provided as 100% funded by the NSW State Government or a mix of State, local and private funding.

Proposed projects have to meet specific criteria set out in the *Walking and Cycling Funding Guidelines* which focus on improving amenity within 2km (walking) and 5km (cycling) catchments of major metropolitan and regional centres. The CSN meets the criteria for those catchment areas.

Cycling Programs in the Active Travel Grants which will fund infrastructure are:

- Priority Cycleways – funding up to 100% by NSW State Government. A project is not eligible if the project is not already identified as a Priority Cycleway in a NSW Government Plan or if the resulting cycleway will not be a NSW Government asset. This funding is intended for infrastructure which involves existing State owned assets such as bridges, traffic lights, rail corridors, state road corridors or existing State Priority bike networks
- Connecting Centres – Council Partnership Funding – up to 75%. Intended to connect local bicycle networks to key destinations by building new infrastructure on local government managed roads, parks and open spaces.
- Cycling Towns – funding up to 100% if supported by council-funded cycling promotion initiatives such as bicycle maps, awareness raising, safety programs etc. This program is intended to support completion of a primary-school-aged safe networks of cycleways within 5km of the town centre.

Some of the existing cycle/shared paths in the CSN have been from these funds. However, the total amount of funding available for projects is relatively small and insufficient resulting in slow completion of sections that facilitate connection and integration for transport. The intention of the CSN is to develop the network as one integrated infrastructure project to ensure maximum efficiency. For example, completion of 15 km of the Fernleigh Track in the Lake Macquarie area was done in 5 stages taking 12 years. In contrast, the efficiencies built into the CSN proposal would deliver an additional 140km to the

existing network within 7-10 years, delivering a total of 230km of cycling/walking infrastructure.

### 6.1.3 Federal Government Funding

The Federal Government does not currently have a specific cycling or active transport policy or strategy. However, funding for constructing cycling infrastructure may be considered in current funding programs aimed at improving infrastructure in regional areas, particularly transport infrastructure:

- National Stronger Regions Fund - The National Stronger Regions Fund will provide \$1 billion in funding over five years for infrastructure projects in Australian regions. However, to date the National Stronger Region's Fund has only funded one cycling infrastructure (a rail trail intended for recreational cycling).
- Stronger Communities Programme - The Stronger Communities Programme will offer \$45 million over two years commencing in 2015-16 for small capital projects in local communities.

In the past, the Federal Government included a 'positive provision' requirement for funding major road and transport infrastructure projects, which mandated the inclusion of active transport in the design of new significant roads. This resulted in the building of a cycle path alongside the M7 in Sydney. However, positive provision is no longer included in Federal Government funded projects.

## 6.2 Planning and Project Management

Who is responsible for our local, state and federal roads?

Confusion can reign when dealing with local and state infrastructure authorities. For example, in the *Draft Hunter City Plan*, figure five shows the Coordinating and Monitoring Committee. Who has the final authority? Who executes the plan and is accountable? The plan is unclear.

The DIRD designates responsibilities for road safety according to jurisdictions <sup>4</sup>.

The Australian Government is responsible for:

- Regulating safety standards for new vehicles, and
- For allocating infrastructure resources, including for;
- Safety, across the national highway and local road networks.

State and territory governments are responsible for:

- Funding, planning, designing and operating the road network;
- Managing vehicle registration and driver licensing systems, and;
- Regulating and enforcing road user behaviour.

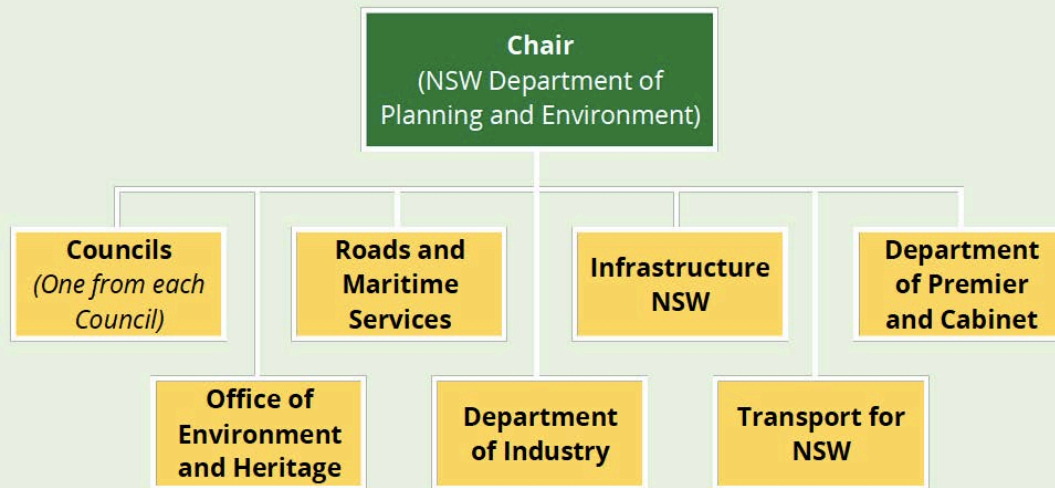
Local governments have responsibilities for

- Funding;
- Planning;
- Designing, and;
- Operating the road networks in their local areas.

The DIRD has a range of functions that support the Australian Government's role in road safety. These include:

- Administering vehicle safety standards for new vehicles;
- Administering the National Black Spot Program and other road funding;
- Administering the keys2drive program;
- Producing national road safety statistics, and;
- Coordinating the National Road Safety Strategy 2011–2020<sup>5</sup>.

Figure 5 Extracted from Hunter Regional Plan Coordinating and Monitoring Committee



*Hunter Regional and Hunter City Plans Coordinating and Monitoring Committee:* Often large projects, e.g. the East West Connect are given to the state authority, TfNSW, or the regional authority, RMS, and managing the Inner City Bypass. Bilateral government teams are made similar to this diagram’s structure to support the overall project and facilitate connections through all levels of government to meet infrastructure and community requirements.

### 6.2.1 Who should be responsible for the CycleSafe Network Infrastructure Project?

According to the Department of Infrastructure and Regional Development the State governments, e.g. Transport for New South Wales and Roads and Maritime Services, are responsible for funding, planning, designing and operating the road network.

The CycleSafe Network Steering Committee expects that consistent with the DIRD that:

Transport for New South Wales design, plan and fund the network.

Department of Planning be responsible for integration into all associated Hunter regional planning documents.

Roads and Maritime Services should collaborate with Newcastle City Council as the local project execution authority on behalf of Transport for New South Wales.

Newcastle City Council and Lake Macquarie Council within their own LGA boundaries maintain the active travel network.



## “Key lessons from best practice infrastructure projects across Australia”

Infrastructure Australia issued a report noting the key lessons from best practice infrastructure projects across Australia. Providing a clear and common sense approach to successful delivery and decision making there are six key best practice planning and procurement lessons the report highlighted<sup>6</sup>. Though these are large infrastructure projects the CSN vision incorporates these management principles into this proposal.

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### **Projects that develop from long term plans and which have robust business cases are likely to be most successful**

The CSN was developed from the long-term plans of NCC, LMCC and state planning authorities, as well as local community bicycling groups. This consultative draft is the first step to building a robust business case, and demonstrates the level of commitment in the community and its support for the CSN.

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### **Strong project governance arrangements mean strong project delivery**

A clear authority for the CSN should sit with TfNSW. In addition, a strong local government and STA working group is mandatory for success.

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### **The procurement model should be chosen on the basis of project specifics and should rigorously follow established published guidelines**

This project offers the opportunity for multiple medium sized construction companies to be operating concurrently across the city (spreading economic benefit), whilst enabling the council to breakdown the tender process into manageable projects. It is likely that if local councils manage the project they will need multiple project managers. Separating the tender for construction into different routes (and look at the project in its entirety) will most likely produce the biggest economic impact, potentially reducing delays and enabling strong community connection. For example, one EIS for one segment would not hold up an entire project. There is a risk to construction quality if multiple companies are involved, however if strong principles and quality assurances are kept by the project managers this likelihood can be significantly reduced.

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### **Transfer risk appropriately in order to maintain value for money**

Where possible the CSN proposes altering DCP requirements to support end of trip facilities in businesses and residential developments, with Section 94 being a suitable alternative. This report acknowledges that the infrastructure projects reviewed here were not low risk whilst the CSN as pedestrian and cyclist transport infrastructure is a lower risk.

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### **Careful management of local and environmental impacts assists project delivery**

Specific active travel managers within local government would be required to support these aspects of the planning and construction.

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### **Be open to learning the lessons from previous projects**

The three-phase approach of the CSN is intended to allow us to learn from each stage in order to improve when building subsequent stages. The research alongside the project will ensure continual feedback and monitoring.

# ALIGNMENT WITH GOVERNMENT POLICIES



Over recent years there has been increased recognition of the importance of walking and cycling, not just as health-enhancing recreational pursuits, but as critical and effective modes of transport.

Local, State and Federal governments all now recognise the importance of increasing active transport – including cycling and walking – as a way to reduce traffic congestion as well as to improve the health of the community. Supportive statements (with motivating photos of healthy people cycling and walking) have been included in transport policies, strategies and plans over many years, with varying levels of resourcing allocated to achieve the goals. However, achievement of the goals set by these documents has been hampered by changing Governments, Ministers and Councillors which results in changing priorities.

Despite the changes, it is encouraging to see the continuing upward trend in recognition of the importance of cycling paths as necessary transport infrastructure, forming part of the total transport planning for an area. The new NSW Regional Plans, for example, include reference to cycling and walking and the *Draft Plan for Growing Hunter City* specifically mentions the CycleSafe Network proposal.

## 7.1 Local Government

### 7.1.1 Newcastle City Council Cycling Strategy and Action Plan 2012<sup>7</sup>

The Newcastle City Council Cycling Strategy formed the basis of the CSN project development. The council strategy identifies a very large number of possible shared paths, from which the CSN proposal selected links. The CSN includes those that would most effectively comprise a workable regional priority network allowing continuous, connected travel, with enhanced safety. In addition, the council strategy at the present rate of funding would take 75 years to build. No road network project would take 75 years to build. In addition, we noted that connectivity between NCC and LMCC would need to occur.

The NCC strategy and action plan targets 5% cycling mode share for trips less than 10km and double the mode share for journeys to work by 2016. The cycling mode share of journeys to work in 2011 was 1.1%. This is unlikely to have increased to 2.3% for the 2016 census. However, there are pockets of high cycling mode share in places surrounding the Throsby Creek Cycleway, such as Maryville at 5.2% in 2011.

These numbers alone do not show the whole picture. In the last few years, NCC has made tremendous strides in their strategy for cycleway development and engagement with the community. Current council staff started a progressive strategy of getting projects shovel ready though funding for construction is not yet available. The current council process stages the concept design, Environmental Impact Statement, and detailed design over 2 to 3 years with the intention of having shovel ready projects for when funding becomes available. This has contributed to their success in receiving RMS active travel grants. Additionally, whilst funding from the National Stronger Regions Fund has been unsuccessful, their applications have contributed to bringing the process forward. This is an advantage as many projects are now relatively advanced.

Road infrastructure improvements have included no longer painting cycleway logos in car door lanes, instead placing them in the centre of the lane, as well as removing logos on roads that are being refurbished. In addition, conversations on curb ramping, the education campaign, and safe cycling classes have enabled the CSN to support the council strategy and promote collaboration in the community.

Collaborating with the CSN steering committee, the council have provided information and support for us to prepare this project and advice on barriers and issues the council must address. This clarity and working relationship has enabled transparency and enhanced positive community relations.

The recent Connecting Newcastle Report indicates that the council's desire and understanding of active travel infrastructure has improved.

### 7.1.2 Connecting Newcastle

The 2030 adopted vision rightly prioritises active travel and liveability. Strategic directions include a connected city with transport networks and services which are well connected and convenient; and making walking, cycling and public transport viable options for the majority of our trips. This would create a more liveable, smart and innovative city.



Image 8 Artist impression of cycle lane and light rail in Connecting Newcastle. (Newcastle City Council.)

### 7.1.3 Lake Macquarie City Council Cycling Strategy 2021

Released in 2012, Lake Macquarie City Council Cycling Strategy 2021 aims to increase the number of cycling trips by residents from a 2012 base of 1% to 5% share of all travel trips by 2022 (Page 3). This Strategy proposed 127 specific proposals for built infrastructure as well as several “indicative future links.”

NCM acknowledges its merit in their review of this strategy, however, it is noted that the strategy failed to commit the Council to any realistic spending on infrastructure that would achieve the stated goal.

The extensive community consultation resulted in an excellent understanding of the current perception of cycling and particularly barriers to cycling (pages 14-20). The outcome of this research was atypical compared with other international research. It reports:

- 73% of respondents said there was too much traffic on the road
- 70% said there are not enough separated bicycle paths.

The LGA of Lake Macquarie is much larger in land area (787.4km<sup>2</sup>) than Newcastle, however it represents a suburban Council with smaller suburban enclaves spread out mainly around the shore of the Lake. There is, however, a reasonable

density of population in the northern and north-eastern portion of the LGA and for this reason the design of the CSN was concentrated in the areas of this population density. The cost of providing CSN family safe standard infrastructure to enable active travel from the further reaches of this LGA would be prohibitive at this stage of building a cycling culture in our community. This was acknowledged in the Strategy.

### 7.1.4 Summary

Each document’s glaring weakness is the funding of active travel infrastructure. Without funding or accountability over the strategy they are just words on a page. The renewed interest in the Hunter area given its growth and potential as an Asia-Pacific regional economy has seen infrastructure development in this region accelerate. If during this accelerated development and funding, active travel is not funded and implemented, the population growth and associated car ownership will only exacerbate liveability issues and hinder the economic vitality of the region. This region will be around in 100 years, but this review wonders how our future children will benefit without planning that considers their health and the individual first rather than a 3 year return on investment.

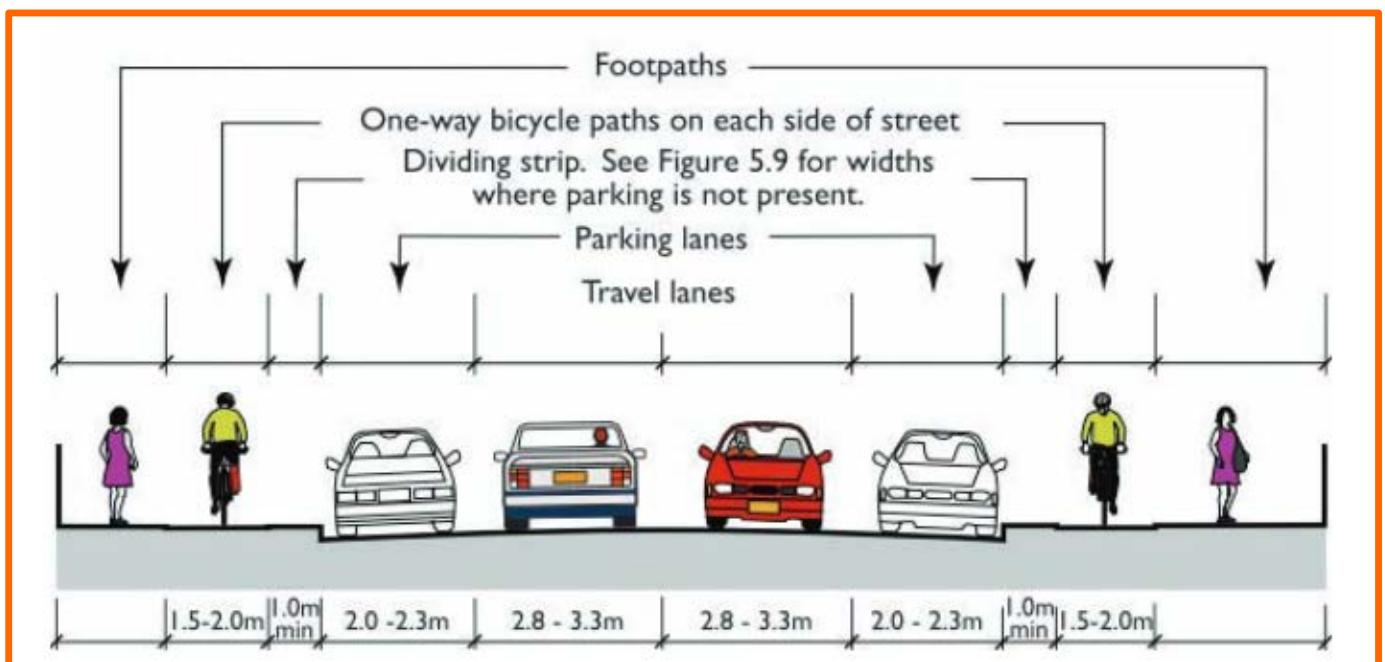


Image 9 Typical cross-section -single direction separated cycle lane. (LMCC)

## 7.2 State Government

**"The NSW Government is committed to working with councils to make walking and cycling safer, more convenient and enjoyable transport options that benefit everyone. By better targeting investment to improve walking and cycling areas where most short trips occur, the NSW Government aims to support more accessible, liveable and productive towns, cities and centres and free up capacity on our road and public transport system for those customers who need to travel further. "**

*– RMS Active Transport webpage, accessed 28 April 2016*

Successive NSW Governments have recognised the need to increase active transport – cycling, walking and public transport – to reduce car congestion and improve community health through increasing physical activity. These aims have been documented – often with specific performance targets to increase transport mode share of cycling and walking – across numerous policy documents including State Plans, State Transport Plans and Health Plans. Grant funding has also been made available, both through cycling specific funds or other funds designed to support local community or local Government activity.

However, despite the long term consistent trend to prioritising active transport, fulfilling the plans and strategies has been challenging as Governments and Ministers have changed, resulting in commitments being cancelled, superseded or just forgotten. The Goals set in the NSW 2021 State Plan released included specific cycling and walking transport mode share targets, and were revised in 2015 and new State priorities set.

We will limit our comments in this section to Plans and Strategies which appear to be still current to the NSW Government elected March 2015.

### *7.2.1 Draft Hunter Regional Plan<sup>8</sup> and Draft Plan for Growing Hunter City*

The Draft Plans for the Hunter area provide a vision for the future with projected significant increases in population numbers and economic growth. The CycleSafe Network proposal will support both of these important goals providing an efficient, sustainable and accessible transport network which will enhance the liveability of the neighbourhoods it connects and improve the health of the residents who use it.

Acknowledging that our region has the largest regional workforce in NSW, Newcastle & Lake Macquarie are above regional average in their population growth and represent the majority of the region's population within these two LGAs. With an additional 150,000+ individuals expected in these two areas alone over the next 20 years, the cities' transport infrastructure will continue to see single car trips dominate and continue to reduce liveability. The new proposed light rail servicing one of these growing population centres is not enough to reduce the demand on the roads and is not an integrated transport project but a segment of an integrated transport network.

The submission by the CSN for the community consultation can be found on the CSN website.

### *7.2.2 NSW Long Term Transport Master Plan*

The NSW Long Term Transport Master Plan was released in December 2012 to provide a comprehensive blueprint with a clear direction for transport in NSW over the next 20 years (ie to 2032). Ten regional Plans (including a Plan for Hunter) were developed to align with this Master Plan.

The Master Plan sets measures and a timetable for action for both cycling and walking. Measures to improve cycling include:

- A long term NSW Cycling Investment Program to improve the planning, management and delivery of cycleways capital programs, supported by design solutions and standards to reflect customer need
- Enhanced cycling routes in regional centres to increase the number of people who cycle. The action allocated to this measure focuses on projects co-funded with councils which improve connectivity.

### *7.2.3 Hunter Regional Transport Plan*

The Hunter Regional Transport Plan was released in March 2014 and acknowledges that our region has the largest regional workforce in NSW. Newcastle & Lake Macquarie are above regional average in their population growth with a majority of the region's population living in these two LGAs.

The need to account for the population growth in these regions and the urgent need to address congestion, environmental and health needs of the region will not be met with plans that centre on increasing car usage. The CSN adaptation of existing cycle strategies developed by NCC and LMCC mean it complements the catchment areas and centres identified in figure 3 by TfNSW. By developing the CSN over the next 7 years, the actions of this Hunter Regional Transport Plan would be supported with better quality infrastructure. Simply put, this would future proof against problems related to high population growth. The Plan also highlights \$2.5 million of cycleway enhancement projects (currently underway or recently completed) through funding from the Traffic Management and Road Safety Program and it identifies 3 programs specifically for cycling and walking:

- Cycling Towns Program
- Walking Communities Program
- Connecting Centres Cycling program

These programs are managed through the RMS Active Transport Program. These and many other action areas and goals would benefit from the CSN. For example, the goal for transforming the Newcastle CBD or improving rail stations with ETFs would be enhanced with the existence of the CSN.

## 7.2.4 Rebuilding NSW, Restart NSW and Making it Happen commitments

Premier Mike Baird's clear priorities outlining how NSW will make it happen and deliver the services required for prosperous state:

1. **Creating Jobs**
2. **Building Infrastructure**
3. Reducing Domestic Violence
4. Improving service levels in hospitals
5. **Tackling childhood obesity**
6. **Improving education results**
7. Protecting our kids
8. Reducing homelessness
9. Driving public sector diversity
10. Keeping our environment clean
11. Faster housing approvals
12. **Improving government services**

### 1 Creating Jobs

The CSN construction would create jobs in construction, council support positions, and support the local economy. Money saved on car driving would add to individuals' disposable income, which usually leads to increased spending. Research around the network with the UON, HMRI, TFI and others, would generate PhD opportunities, collaboration with other funding bodies and outreach programs.

### 2 Building Infrastructure

The Making it Happen website states, "Improving road travel reliability. Congestion across metropolitan Sydney is estimated to already cost up to \$5 billion per annum, and will rise to \$8 billion by 2021 if nothing is done.

"To ensure consistency of journey times on key roads continues to improve, we are working to make better use of existing road infrastructure, build extra road capacity and encourage commuters to use public transport and to undertake off-peak travel more often. This will enable businesses and the community to move around the city with greater ease, reducing travel times, boosting productivity and reducing business costs."<sup>9</sup>

Critical to achieving this, the \$4.1 billion reserved for regional transport must include active travel in order to reduce congestion. Active Travel infrastructure must be part of the strategy to make better use of existing road infrastructure. Many of the pathways are able to be built within the current road corridor. It is a way to build extra road capacity through efficiency; for example, mode shift and encouraging public transport connections. Additional infrastructure jobs for end of trip facilities, infrastructure throughout the area for public and private spaces would be needed.

### 5 Tacking Childhood Obesity

"Reduce childhood obesity by 5% across 60,000 kids in the state."

Critical to the conversation is the far-reaching negative impacts of unhealthy habits which can affect a child's learning capabilities and their mental health in addition to their physical wellbeing. Childhood obesity is an epidemic threatening the future of the Australian economy and liveability.

### 12 Improving government services

"Ensure on-time running for public transport - Maintain or improve reliability of public transport services over the next four years. The Government is also improving integration across public transport services, updating timetables and providing clear information to get people to their destinations on time."

Critical to achieving this improvement in reliability is the integration of active travel infrastructure pathways and times within public transport services



Image 10 Cyclists on Hunter Mall merging into Scott Street. (Megan Sharkey)

### 7.2.5 NSW Government State Infrastructure Strategy

The recommendations are for infrastructure projects and programs valued at \$18.9 billion with priority given to reducing congestion, supporting population growth and stimulating productivity across Sydney and regional NSW.

The CSN prioritises safety and connectivity, which will encourage more people to utilise pedestrian or cycling trips on the network which keeps them off the road. The more convenient access people have to using active transport in preference to private car use, logically, the bigger the positive impact on congestion. Additionally, there is growing quality evidence that a workforce engaging in daily physical activity is more productive. The CSN provides an opportunity for more people to engage in this incidental activity through their daily commuter travel. This level of activity could have a big impact on worker productivity, as well as personal health.

### 7.2.6 NSW BikePlan 2010<sup>9</sup>

The plan targeted doubling the use of cycling to get to work, across all of NSW, between 2006 and 2016. Between 2006 and 2011, the state average remained fairly unchanged as a whole, however pockets in places like Maryville in Newcastle or the Inner West in Sydney where cycleway connections or routes were built, experienced increases in mode share.

### 7.2.7 Transport for NSW Disability Access Plan<sup>10</sup>

The Plan identifies six critical issues to address:

1. How we build a transport network that is accessible to all our customers and increases our compliance with the Federal Disability Discrimination Act 1992 and accompanying disability standards.
2. How we can reduce transport disadvantage for people with disability through targeted concessions, support programs and projects and initiatives that improve access to transport in local communities.
3. How we can improve the journey experience of our customers through improved information, convenience and services.
4. How we engage with people with disability to understand what they need from our services.
5. How we improve partnerships with local councils and other areas of government to ensure that there are no unnecessary barriers
6. How we provide additional employment opportunities for people with disability.<sup>11</sup>

In particular, the CSN would support independence among individuals with disability. They would be able to exit their door and access infrastructure which is wheelchair friendly. With the CSN standards, individuals would not need a lift or escort to assist with curbs, however integration with public transport infrastructure is key.



Image 11 Olympian on handcycle in traffic. (Sara Stace)



### 7.2.8 NSW Active Travel Charter for Children<sup>12</sup>

The Charter is a joint collaborative charter with over 20 government and non-government agencies signing and supporting the charter. Whilst no specific responsibilities are identified, it provides a solid foundation for the principles that are required for active children. In the table below, some charter strategies and the CSN project's support or learnings are comparatively noted.

| Charter Strategy   | CSN Principle and Project Support  |
|--|--|
| Promoting the benefits of safe active travel within the community  | CSN provided feedback on the NCC cycling education campaign and provides support with messaging and dissemination.   |
| Support active travel where local environments provide safe infrastructure   | Supporting cycling education classes.  |
| Encouraging an active lifestyle at home, school and within the community   | Working with council and other NGOs to spread active lifestyle messaging through being able to access family safe infrastructure.  |
| Taking trips to school and work using public transport   | The CSN principles of family safe and world class infrastructure will ensure safe paths and end of trip facilities are available.  |
| Reducing speed limits in residential areas so that active travel is viewed as a safer and more attractive option for families  | The CSN supports a 30km/hr speed limit in residential areas where bike boulevards and schools are present.   |
| Reviewing the local traffic environment where children travel to assess risk   | The CSN primary network will be located within 1 kilometre of 95% of schools in the region. The further research and secondary network would focus on schools and improve the local environment from the primary network to schools. |
| Supporting local decision-making to improve the condition of pathways, footpaths, shared paths and roads   | The CSN steering committee actively comment and have members on both NCC and LMCC cycling working groups.  |
| Increasing road signage in school zones  | The CSN principle of family safe supports visibility to motor vehicles and safety improvements to vehicle travel lanes.  |
| Supporting the provision of facilities to promote active travel (e.g. bike and scooter racks) if suitable  | ETFs are embedded in this proposal and are required to support active travel. The CSN group in the future will be making submissions to DCPs for improved requirements to the ETFs.  |
| Offering age appropriate skills training for parents and children towards safer walking, cycling and scootering  | The CycleSafe education classes currently run by councils and the proposed expansion in schools would foster and encourage safety in active travel and motor vehicle travel.   |
| Parents or carers accompanying their children while cycling on the footpath  | Family Safe means that a primary school aged child should be able to ride safely by themselves on the shared paths.  |
| Working collaboratively with local government to improve the active travel infrastructure (footpaths, shared paths and safe bicycle path networks) in the community, particularly around schools | The CSN steering committee have members on both NCC and LMCC cycling working groups and have begun engaging with P&C committees in local schools.  |

7.2.9 NSW Healthy Eating and Active Living Strategy: Preventing overweight and obesity in New South Wales 2013-2018<sup>13</sup>

Preventing the widespread negative impacts that obesity can have on our population is imperative. Whilst this strategy identified active travel as a mechanism for behaviour change it fails to be vocal about the effects a lack of infrastructure can have on physical activity choices.

The government's targets are to:

Reduce overweight and obesity rates of children and young people (5-16 years) to 21% by 2015.

Stabilise overweight and obesity rates in adults by 2015, and then reduce by 5% by 2021.

Increase participation in sport, recreational, arts and cultural activities by 10% from 2010 levels in rural and regional NSW and in Sydney by 2016.



Image 12 Practicing new Christmas bikes on a Perth shared path. (Sara Stace)



Image 13 Kids biking and riding a scooter to shops with mum - on quiet back laneways. (Sara Stace)

### 7.2.10 Cycling Safety Action Plan 2014-16<sup>14</sup>

Underpinned by the 'Safe System' the action plan focuses heavily on bicycle behaviours to promote safety rather than infrastructure improvements.

**Safe People** – the actions predominately centre around bicycles operating under the correct road rules and mitigating risky behaviours. A few of the actions were directed to improving driver awareness of cyclists and sharing the road.

**Safer Roads and Speeds** – The actions within this theme do not centre on infrastructure improvements or reducing speeds except for bicycle riders to reduce speeds on shared paths. Reduction of vehicle speeds, though mentioned in the Pedestrian Safety Action Plan, does not factor here.

**Safe Vehicles** – Centres around bicycles improving their safety devices on their bikes, however given that most crashes are not caused by the lack of safety indicators such as lights or not wearing helmets, it is unlikely to improve real safety.

The recent increased fines and compliance measures have indicated that the actions undertaken by this plan have not centred on infrastructure but cyclist behaviour.

### 7.2.11 Pedestrian Safety Action Plan 2014-2016<sup>15</sup>

Pedestrian safety is a real concern. According to the National Department for Roads, 1,206 people were killed on all roads in 2015, of these 31 were bicyclists (3%) and 157 were pedestrians (13%).<sup>16</sup> In NSW, the 2013 to 2015 average was 9.3 pedestrians killed, however in the first quarter of this year 16 pedestrians have been killed on the roads.<sup>17</sup> In order to prevent these types of deaths this action plan identified key areas: Safer Speeds, Safer Roads, Safer Vehicles, Road Safety Technology, and Safer People. Only safer speeds is discussed here.

#### Safer Speeds

The plan notes the speed at which a pedestrian is killed in figure 6. School zone limits are regulated in NSW at 40km/hr, yet there is still a 25% fatality rate; however utilising 30km/hr would lower the risk to 10%. Action seven states, "Canvas international and interstate research and evaluation into best practice speed limits (e.g. 30km/h) to guide improvements for pedestrian safety in heavily pedestrianised areas." Whilst the Pedestrian plan notes 30km/hr investigation the other plans and active travel charter for children do not address the 30km/hr or state that 40km/hr is acceptable. The CSN would be able to assist by increasing safety.

One of the proposed treatments, bike boulevards, would be suited to 30km/hr research and likely mitigate rat racing through suburbs or near schools, and encourage school ridership with lower speeds around schools. The CSN could assist with comprehensive research on the 30km/hr action item, as well as action item 29 on shared path research, through the collaborative and multi-disciplinary research being developed through this project.

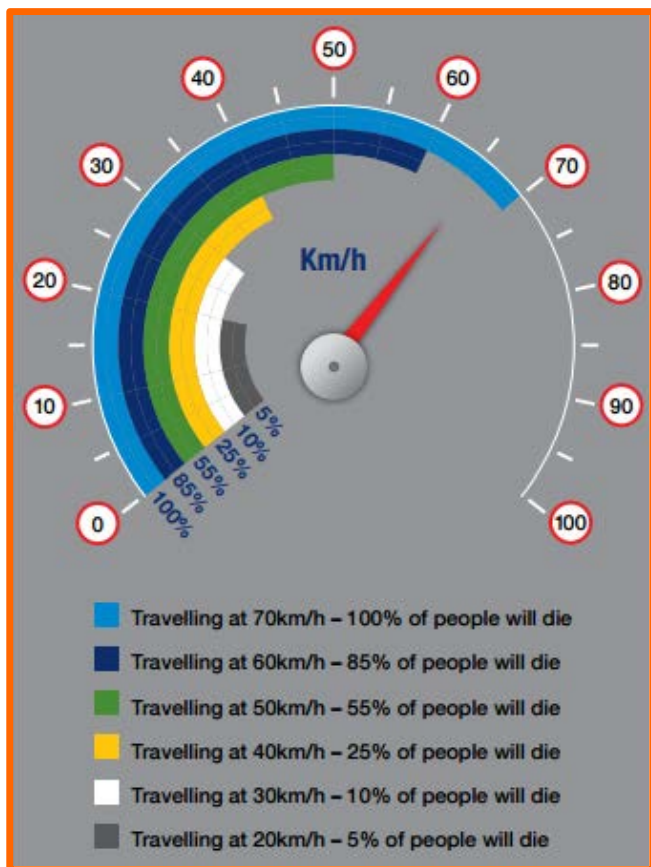


Figure 6 TfNSW percentage of pedestrian fatalities when struck by an oncoming vehicle at various speeds

## 7.3 Federal Government

Specific federal government targets to increase cycling and walking, or reduce childhood obesity was difficult to find as many policies are strategic directives or funding support, but not specifically a government target.

### 7.3.1 *The National Road Safety Strategy 2011–2020*

The National Road Safety strategy focuses heavily on casualty reduction targets to be achieved by the end of 2020, which are to reduce the annual number of:

- Road crash fatalities by at least 30%
- Serious road crash injuries by at least 30%<sup>18</sup>

The CSN would provide separated infrastructure reducing driver and cyclist interactions.

### 7.3.2 *Australian Infrastructure Plan*

The Infrastructure Plan's four key objectives: Productive Cities, Productive Regions; Efficient Infrastructure Markets; Sustainable and Equitable Infrastructure; and Better Decisions and Better Delivery, set forth key areas and an action list to provide a solid foundation for infrastructure development a delivery across Australia. In particular the plan notes,

- Governments need to establish a more rigorous evidence base for infrastructure investment decisions. Key steps include:
  - Increasing the quality and consistency of long-term infrastructure planning;
  - Deepening stakeholder engagement;
  - Allocating increased funding for project development work, such as business cases;
  - Improving the transparency of decision making and

- Ensuring the consistent delivery of post-completion reviews<sup>19</sup>.
- Governments should provide active transport (walking and cycling) infrastructure that is connected, safe and encourages a shift towards a more sustainable transport network.
- Where it has not already happened, governments should integrate active transport strategies with wider land-use and infrastructure planning<sup>20</sup>.

The government's own priority project lists fail to address active travel networks or show how the integration of active travel is occurring in those priority projects<sup>21</sup>. Within Newcastle the plan's goals to deliver quality urban infrastructure centre on freight rail upgrades in the regional area and rail upgrades from Newcastle to Sydney.

The CSN would contribute to the goals of the Australian Infrastructure Plan and this consultative draft echoes many of the key steps the government put forward, such as increasing quality with higher safety standards, consulting with residents, business and governments to contribute to this project and provide an open conversation, using research to build a solid framework and data for decision making, and finally, the phased staging of the project will allow for improvements and upgrades to the network as it is constructed.

### 7.3.3 *Ministry for Health*

The Federal Government Ministry for Health, program and initiatives, do not offer any initiatives, which could be found on their main programs and initiatives webpages, that appeared to directly target childhood obesity through behaviour change or infrastructure methods<sup>22</sup>. The Kids Matter<sup>23</sup> program is all encompassing, however doesn't not specifically target physical activity as a tool to for other children's well-being issues like confidence, concentration in school and general mental health.

## 7.4 Joint Federal and State Regional Plans

### 7.4.1 Hunter Strategic Infrastructure Plan<sup>24</sup>

This plan seeks to optimise the Hunter Metropolitan Area's (HMA) potential and capacity to emerge as a liveable and vibrant city and grow as a robust and productive economy. The plan covers the five Lower Hunter Council areas of Newcastle, Lake Macquarie, Maitland, Port Stephens and Cessnock and considers the wider Hunter Region.

Given the growing importance of connectivity as a key determinant of the liveability and productivity of the HMA, projects which focus on removing critical problems in the operation of the transport network have become initial priorities. The region could optimise liveability and connectivity by giving the community new transport options (that are easy and safe to use) instead of the usual list of road projects that simply encourage further car use and increased congestion. It has been said that curing congestion by building roads is like curing obesity by sewing bigger trousers.

### 7.4.2 Hunter Economic Infrastructure Plan<sup>25</sup>

The Hunter region economy and future growth plan is dominated by the mining sector and whilst the region has benefited greatly from this resource, governments are increasingly looking for alternative viable options to support the region's economy into the future. There is pressure on small communities to adapt to change and on businesses to find more environmentally friendly mechanisms to stay operational. Whilst a comprehensive analysis would need to be completed to demonstrate the full impact of each alternative, an immediate, easy means for starting a potentially economically viable industry is considering tourism options. The CSN could have an impact on tourism in the area which would impact the local economy in the shorter term.

Among the priorities considered in this plan (ports, rail, electricity, roads and water), the CSN is most relevant in the discussion regarding roads. As previously mentioned, maintaining active transport options on all new and existing road infrastructure is preparing the region for future economies (whatever they end up being). In addition, encouraging active transport can reduce the actual numbers of road users overall.

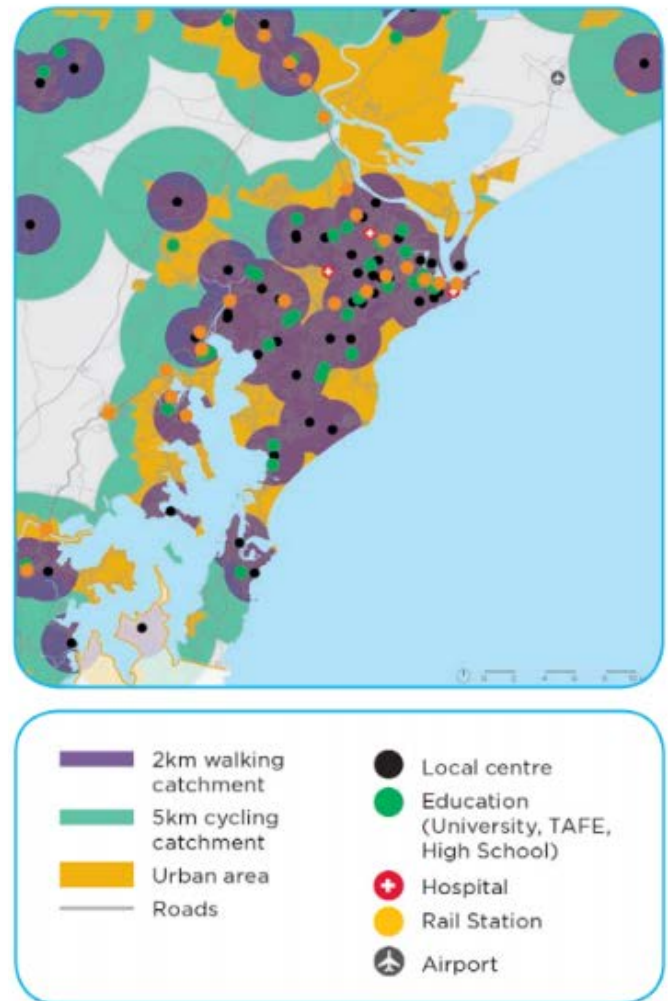
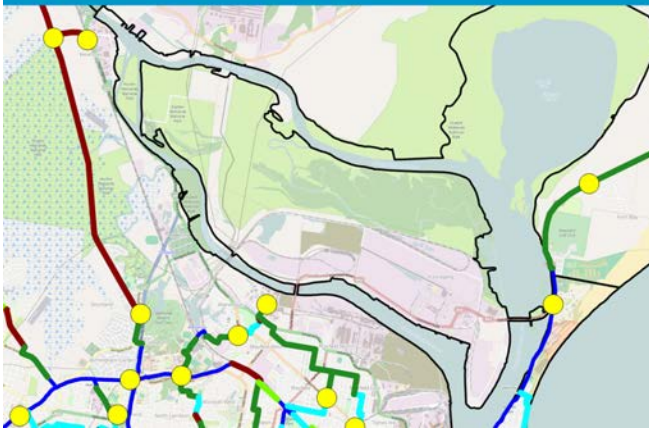


Figure 7 Newcastle walking and cycling catchments

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# POTENTIAL BENEFITS OF THE CSN



## 8.1 Urban Planning

Transport underpins the economy. The forms of transport we have now invented allows us a macro mobility never before granted enabling global transfer of goods, knowledge, interactions with a wider community, and also population growth. How transport is planned, government policy, and its subsequent economic benefits intertwine to make cities tick and ultimately dictates Australia's position in the global economy.

Understanding the world-wide trends, best practice planning and infrastructure design is imperative to ensuring Australia is prepared for the challenges ahead.

*8.1.1 Integrating Transport and Development*  
Integrating transport with urban development is a common problem for governments with multiple agencies and various stakeholder considerations. Many see the car-centred urban housing policies as contributing to the collapse of public transport investment and usage over the previous 30 years. The International Transport Forum noted many governments' problems combining urban planning and transportation needs originated in a few areas<sup>26</sup>:

- Investment, planning and implementation of urban transport are often divorced from complementary urban development policies, for example
  - Affordable housing policies or first home buyers grants for inner city homes, and
  - LEP & DCPs that encourage multi-storey residential apartments to be homes and instead of exclusively short term apartments or non-children residences.
- National frameworks may promote urban sprawl and thus increase the reliance on private modes and higher distance travel to meet urban mobility needs, for example
  - Land releases in areas which form the agricultural bowls of Sydney
- Transport improvements in the absence of land-use planning will not meet objectives of reshaping urban development
- Government fragmentation complicates the alignment of low-carbon objectives
- Absence of (physical, operational, fair) integration among multiplicity of transport policy weakens the competitiveness of low-carbon transport modes
  - The Opal Card has provided an integrated system across multiple modes, but this does not integrate with bike share schemes.
- Inconsistent policies within the urban transport sector hinder effective overall transport demand management.
  - For example, to build or not to build? Every election cycle.

- Misalignment of fund allocation mechanisms with low-carbon objectives limits financial viability of public transport and non-motorised modes, for example
  - Private vehicle infrastructure spending receives the majority of the funding.

Transit oriented developments aim to overcome many of these issues. TODs can be as simple as planning a good public transport infrastructure corridor and connections, then changing LEP and DCPs to support mixed-use development. Local government engagement with TODs and policies around transport interchanges or facilitating connections to those interchanges drive greater uptake of TODs<sup>27</sup>.

Figure 8: GHD chooses Transport Oriented Development

### GHD chooses Transport Oriented Development

GHD moved its 500-odd staff into a purpose-built office at 999 Hay Street, Perth, including 180 lockers and 120 bike parks. Lying alongside the main north-south bikeway that runs through Perth, GHD have approximately 20% of staff cycling to work up from the 11% previously. The Financial Review quoted GHD Head of Property Craig Muir saying transport was a major decision in their location and noted the strengthening trend towards valuing cycling as an amenity.

### 8.1.2 Australian Trends

Infrastructure Australia notes “While Australian cities have been planned predominantly for private motor vehicle travel, economic analysis of infrastructure projects relating to walking or cycling infrastructure has shown benefits via decongestion, health, reduced vehicle operating costs, infrastructure savings, and environmental benefits.”<sup>28</sup> Urban planning policy in Australia over the last 50 years has been car focused development and greenfield development. Over the last 5 years, however, a significant uptake in Australia towards brownfield development and urban infill. Though this is encouraging transit oriented development, many major road projects are still in development, rail projects notoriously lagging behind, and planning documents still opening new land release areas.

In the CSN area, Newcastle and Lake Macquarie followed the national urban planning trend with low density housing being the main residential housing type and a high car ownership rate. Urban sprawl could easily be exacerbated across the Hunter running through much of the prime agricultural land.

The Draft Hunter Region Plan continues this trend failing to provide active transport infrastructure. The plan acknowledges and advocates for increased walking and cycling transport mode shares, however only includes this as recreational infrastructure and green corridors.

**Newcastle’s current revitalisation provides opportunity to drive urban planning changes and support population growth utilising mixed-use developments and sustainable infrastructure. It should not be missed.**

— Megan Sharkey, Chair of the CSN



## 8.2 Connectivity of the CSN

### 8.2.1 The University of Newcastle

In 2017, the University of Newcastle will open a new campus, NewSpace, in the heart of Newcastle CBD. It will bring approximately 3500 students to the University of Newcastle City Campus. Connectivity between Callaghan will be key as students may still be required to take classes at both campuses.

The University of Newcastle hosts two state of the art bike hubs. They are an excellent example of end of trip facilities. Opened in August 2014, they provide secure bike storage and end of trip facilities for use by students. Each hub has 52 bike storage racks and 44 lockers. The bike hub facilities have 24 hour a day access, using a student or staff card to gain entry.

Bikes can be stored in one of the two types of bike storage racks available, vertical and horizontal. The lockers are individually pin protected by your own unique chosen 4-digit pin, however the lockers are programmed to automatically unlock at midnight every night. Unisex showers and toilets are available within the hubs and these are cleaned daily. CCTV cameras also operate outside the buildings and the facilities are included in regular Campus Security patrols.

If your bike breaks down on campus - no worries! The bike library provides bike servicing Monday to Saturday 9am to 5pm, as well as the option to buy or borrow bikes.

Hubs are consistently full during semester.

### 8.2.2 John Hunter Hospital

The CSN Steering Committee understands to date that the Inner City Bypass concept designs have no separated cycleway or off-road cycleway running parallel to the road. As a key destination, this connection to the John Hunter Hospital must be built. The CSN recommends a separated pathway on Lookout Road.

John Hunter Hospital has limited bicycle parking and high traffic congestion. Set atop a hill and being a major destination, it experiences significant traffic volumes.

Because there is limited bike parking and only one off-road pathway from Jesmond park (which is unlit), if staff were able to ride to John Hunter Hospital it would help to significantly reduce traffic in the area. The Inner City Bypass extension may assist in easing traffic, but a long-term strategy is required.

Connecting key destinations from Charlestown to John Hunter Hospital to the University, this route (the Inner City Bypass) would offer the opportunity for an efficient cycling 'highway' when established as part of the CSN.



Image 14 University of Newcastle Bike Hubs. (Megan Sharkey)

### 8.3 Global Shift from Cars

Across the globe, the known effects of car-centred urban planning and general use of fossil fuels has cities rethinking the way we use and plan them. A recent study examined the effects of A Global High Shift Cycling Scenario and found that we could save nearly \$1 trillion a year in various road related costs by shifting to cycling<sup>29</sup>, but who would use them?

Research around the world has shown that individuals are turning away from car ownership and car usage. Car usage in the developed world is perceived as having peaked, though car ownership may continue to rise slightly.



Image 15 Teens on train. (Sara Stace)

In Australia, car licence ownership garnered national attention with The Conversation article entitled “Why are young Australians turning their backs on cars?”<sup>30</sup> The article noted that Victorian millennials had a 77% to 66% decline in car licensing rates, though in New South Wales the downturn trend has levelled since 2012 and increased in the last year. What the news cycle didn’t mention, but researchers noted, was the other policy and infrastructure changes which occurred, stating:<sup>31,32</sup>

- Melbourne’s public transport system’s increased patronage strongly correlated to a decrease in car license ownership.
- New South Wales did not have an uplift in public transport patronage nor significant investment.
- Australia car ownership rates were still increasing though other related factors were decreasing.

In Newcastle and Lake Macquarie 87.7% of private dwellings had at least 1 or more registered cars, over the NSW total of 86.4%, but below the Australian total of 88.4%.

In 9 of the 14 countries, reviewed in an international study, car license ownership decreased for millennials in all developed countries.<sup>33</sup> There are six reasons which contribute to this:

## 1 LIFE STAGE

Youth educational pursuits decrease likelihood of full time employment, and individuals are more likely to be living at home and financially dependent.

## 2 AFFORDABILITY

The cost of getting a licence is often cited as a disincentive. The research is unclear if this is a real impact as it appears to be a perceived impact. Housing affordability does have an inverse correlation to transport spending, for example younger people are spending more on housing than 10 years ago but less on transport, which is having an impact on their decisions about owning cars.

## 3 LOCATION AND TRANSPORT

Millennials are living in urban areas or areas where they don't need a car to get where they want. The same can be said of other age categories with 50% of the population living in urban areas (and this figure is increasing). Whilst driving distances may have gone down, car passenger miles increased in the millennial group across the world.

## 4 DRIVER LICENSING REGULATIONS

Car licensing and ownership trends in millennials were decreasing prior to stricter graduated licensing requirements, however it is "difficult enough to provide another reason for those who need one".

## 5 ATTITUDES

The research is unclear as to whether car status symbol attitudes or the perceived adult responsibility of car ownership are influencing car licensing and ownership in young people.

## 6 COMMUNICATION

Overall the research is still unclear about how communication is impacting trends due to the rapid change and growth of smart communications and mobility capabilities. What is clear is that the younger generation want more smart communications and that the increase in public transport real time information and internet capabilities support staying connected whilst on the move.

### 8.3.1 Public Transport Usage

Public transport is a key in urban environments moving large numbers of people efficiently. If the number of cars matched the total number of people, roads would not function. Cities are large, and mobility for millions of people over a range of

distances is necessary on daily basis. Public transport is the most efficient tool for this.

The Infrastructure Australia report compared the cost recuperation of public transport fares versus international competitors showing Australia at 25 – 30% remarkably below the 80 – 120% recuperation of the other cities. The report noted that "This raises questions about accessibility versus cost recovery, the sustainability of current financial structures and the scope for further public investment in mass transport infrastructure and services."<sup>34</sup>

The report failed to mention the reviewed cities Munich, San Francisco, Washington, D.C., Hamburg and Singapore, have integrated and connected transport systems across walking, cycling, buses, light rail and heavy rail. It is difficult to assess a connected network and the effects on reduced patronage and the cost recovery of that service. Australian Government research backs this assertion finding in 2012, which found that only 28% of people "preferred the convenience, comfort, or privacy a private vehicle provided", so why aren't the other three-quarters of the population using it? Lack of services, for example non-existent or poorly-scheduled timetables was cited as the reason why 53% of the population were not using public transport. Many routes only come once an hour on Sundays or for some, everyday and some have a narrow window of daytime operation. If cost recovery is an issue then connectivity of the current network with other modes and integration of express routes with frequent travel should be considered.

So why is public transport important to the CycleSafe Network? Integration of public transport and active travel can drive high mode shares in each by providing options for a variety of trips. In particular, end of trip facilities or integration of cycling into public transport is key. End of trip facilities require secure bike parking, lockers and/or showers, that can be integrated together or stand-alone. A stand-alone facility, for example parking in one facility and showers, lockers and toilets in another, may be more amenable to pedestrians or users with limited mobility.

### 8.3.2 Smart Cities

The impact of better infrastructure services on energy, water and transportations systems is driving Smart Cities movements. Smart Cities are defined as “urban areas that make use of information technology to address social, economic and environmental issues creating sustainable economic development and a high quality of life.” The Smart Cities Council refers to Smart Cities as those that have digital technology embedded across all city functions<sup>35</sup>. Using data to drive decisions that make improvements to people’s quality of life, Smart Cities should enhance sustainability. The Smart Cities Council also believe that “bike friendly cities are smart cities.”<sup>36</sup> For example, the bike share and bicycle parking apps for Smart City initiatives.

Locally we could foster data and socially driven change. Local Innovators have created Social Pinpoint who “provide online tools that improve the way organisations engage with their communities and stakeholders. Reach a broader audience. Increase participation rates.”<sup>37</sup> The CSN could use this to instantly map dangerous routes, track uptake rates, favourite parking areas and more. It would provide valuable feedback to Councils, the research, and the community on the benefits of utilising the CSN. In addition, it would help to source design improvements to be made if necessary.

## 8.4 Infrastructure

Figure 9 Case Study 1 SHARING THE ROAD: findings from the USA. Michigan Department of Transport & University of Wisconsin Joint Research Findings

### CASE STUDY 1

**SHARING THE ROAD:** findings from the USA. Michigan Department of Transport & University of Wisconsin Joint Research Findings

“Countermeasures that were associated with the greatest reductions in crashes included:<sup>38</sup>

- Sidewalks reduce pedestrian crashes by 88%, while adding shoulders reduce pedestrian crashes by 70%
- Roundabouts show an overall decrease in all types of crashes by 35%, injury crashes by 76% and fatal crashes by 89%
- Road diets reduce all crashes anywhere from 14% to 49%.
- Raised medians reduce all crashes by 40%, and by as much as 69% at intersections that were not signalised
- Pedestrian hybrid beacons were shown to have a 69% reduction in all crashes and a compliance rate of motorists yielding to pedestrians between 94-99%”
- Bike lanes can reduce bicycle crashes by 50%”

Figure 10 Case Study 3 New Zealand

### CASE STUDY 2

**NEW ZEALAND**

New Zealand road safety strategy 2010-2020 has identified that annually, the social cost of road crashes is estimated to be \$3.8 billion.<sup>39</sup> New Zealand put a strong focus on walking and cycling road safety engaging a cycling safety panel to address all the barriers and immediate actions required.<sup>40</sup>

### CHARLESTOWN TO COAST (C2C) CASE STUDY

The Lake Macquarie Cycling Strategy recognised the importance of the Fernleigh track as an existing piece of cycling infrastructure, as well as multiple Lake Macquarie council planning instruments which refer to the significance of Charlestown as the major commercial centre in the LGA.

The Fernleigh track runs north-south approximately 2km to the east of the Pacific Highway at Charlestown, and it would be reasonable to prioritise the provision of active travel infrastructure which connects the Fernleigh Track to Charlestown.

LMCC strategy provided for this in a north route and a south route, both of which were “proposed on-road cycleways.” There was no indication of proposed separation from heavy vehicle traffic in these proposals.

- North; Specific Proposal Charlestown 4, and various unnamed on-road cycleways around the roads on the eastern side of the Pacific Highway.
- South; Charlestown 7, but with a very convoluted route of either Charlestown 8, or Charlestown 12, 10, and 5, or some other route with no proposal at all, to connect to Charlestown Square. Charlestown 7 is proposed for along Dudley Road, a very busy feeder from multiple suburbs to the Pacific Highway.

Further to this, the Specific Proposed Charlestown 5 is the only one that goes directly near a public school, and close to St Josephs private school.

The CSN committee considers these provisions inadequate compared to the potential value of linking the Fernleigh track to Charlestown. An alternative is the Charlestown to Coast (C2C).

NCM members and other concerned community members have developed an alternative major route connecting Charlestown Square to the Fernleigh track, and going further to Dudley using the historic Dudley Spur line route. The Dudley Spur lines were considered in The Strategy as Dudley 1 and 2.

This proposal starting at Charlestown Square, Pearson and Fredrick Street corner, achieves a high level of safety with a bi-directional separated path and provides safe access to

- 5 schools,
- Charlestown Library,
- Charlestown Swim centre,
- The Fernleigh track,
- **Dudley “country” pubs,**
- **The Awabakal Nature Reserve, and**
- **5 sporting fields**

If built as the C2C proponents recommend it would also ensure separation of bicycle traffic from the very popular bush walking route, The Great North Walk. This facility has a great deal of appeal as a walking trail. There are plenty of occasions where walkers cannot see homes that they may be able to hear due to the thick bush setting of this trail. The solitude of this trail situated in in the middle of the suburbs of Australia’s 7<sup>th</sup> largest city is well worth preserving as a walking only trail.

To this effect the NCM have asked that the C2C proposal becomes part of the Council’s Cycling Strategy. This C2C proposal would be a considerably higher expense than painting cycle lanes on to existing roads as per specific proposals Charlestown 4, 5, 7, and 8 etc., however it would improve safety considerably as well as connections to key destinations.

## 8.4.1 Road Safety and Rules, Regulations, and Fines

### 8.4.1.1 Road Safety

Across the world, countries with strong cycling and walking mode shares prioritise them in the road rules and modal hierarchy. In the majority of the sections of this report we have used non-European examples for cycling; however, when it comes to road infrastructure safety and road rules, Europe provides best practice safety examples.

Denmark is widely known for 40% plus mode shares and high road safety practices of:

- 0-30km/hr no separation
- 40km/hr painted lanes
- 50-60km/hr curbed separated lanes
- 70-130km/hr fully separated by a median
- Infrastructure placed on the footpath side of parked cars.
- Bi-directional only off-street.

In the UK, which is rapidly building cycleway infrastructure, they identified (Dec 2014) that there are 5 (pre-) conditions that are common in cities with mature cycling cultures, recent increases in cycling mode share, and those committed to growing cycling (albeit from a low base):

1. "There is strong, clear, political and technical pro-cycling leadership which is supported through all parts of the lead organisation.
2. "Cycling is considered an entirely legitimate, desirable, everyday, 'grown up' mode of transport, worthy of substantial, planned, long-term investment, even if current cycling levels are comparatively low.
3. "Increasing cycle mode share is part of an integrated approach to decreasing car mode share. There is no intended overall abstraction from walking and public transport; and improving cycle safety and convenience is not intended to diminish pedestrian safety and convenience.
4. "Loss of traffic capacity or parking to create better cycling facilities, while often a considerable challenge, is not a veto.

5. "There is no differential cycle route branding, simply three principle types of cycle facility that make up well-planned and designed cycle networks:
  - a. Paths/tracks/lanes on busier streets which provide a degree of separation from motor vehicles that is appropriate to motor traffic flows/speeds and the demand for cycling.
  - b. Quiet streets/'bicycle streets' with 30kph/20mph or lower speed limits and often restrictions on motor vehicle access, particularly for through movements.
  - c. Cycleways/'greenways' away from the main highway (e.g. bicycle-only streets, paths in parks and along old railway lines and canals), but still well connected to the rest of the network at frequent intervals.
6. The frequency of occasions when cyclists need to give way or stop is minimised. This means that people cycling are able to make steady progress at a comfortable speed."

### 8.4.1.2 Dangerous Infrastructure and Unclear signage in Newcastle, Lake Macquarie and NSW

Cyclist safety is paramount. In New South Wales, disconnected, changing infrastructure and unclear signage confuses users. For example, instances where the infrastructure changes suddenly from a separated shared path to being on the road amongst traffic, or the "safe" bike lane finishing and the only way forward being a busy, frightening road. This can be very confusing especially to first time users. Without a safe network, it is very easy to put off cycling because of one dangerous missing link.

From the Road Users Handbook:

"Tips when driving near bicycle riders: When overtaking give bicycle riders a safe amount of space. This means at least one metre to the side in a 50 km/h zone. If the speed limit is higher, bicycle riders need more space for their safety."<sup>41</sup>

## Newcastle Voice Survey

The Newcastle Voice survey results reflect the need for safe cycleways, consistent infrastructure, education, and a broad based approach to increasing cycling participation in Newcastle.<sup>42</sup> The survey found:

Over 42% of Newcastle Voice respondents indicated that they felt 'unsafe' or 'extremely unsafe' when riding their bike.

Bike riders felt the least safe when riding their bicycles along major roads, with 89% of respondents indicating they felt 'extremely unsafe' or 'unsafe'.

Riding on backstreets, amongst cyclists and on the Fernleigh Track scored relatively similar scores from respondents as being 'extremely safe' or 'safe' – 64%, 67% and 66% respectively.

Nearly half (47%) of the Newcastle Voice respondents stated that they had been yelled at or abused by motorists within the last 12 months.

When asked if they had ever been hit by an opening car door or had to swerve into traffic to avoid it, approximately 52% said they had.

Almost 55% have had a near miss where they were almost hit by a vehicle while cycling in the last 12 months.

Within the last five years, 13% have been injured in a collision with a vehicle while cycling. Of those respondents, only one sixth had reported the incident to police. It is generally understood that a substantial proportion of non-fatal pedal cycle crashes are not reported to the police.

56% of respondents indicated that they infrequently, rarely or never cycle, but indicated that the following would encourage them to start cycling or to ride more frequently:

- Availability of bicycle dedicated lanes and off road routes (60%)
- Safer, better lit cycle paths (47%)
- Better road/traffic conditions (38%)
- Increased driver awareness of bicycle safety and sharing the road (35%)
- Improved, continuous marking of shoulder lanes (33%).

For all respondents, the top five future cycling improvements to enhance riding in Newcastle are as follows:

- More on road routes physically separated from traffic (94%)
- More off road routes (90%)
- Increased driver awareness about cyclists (87%)
- Marked routes with pavement markers (bike logo, route number and direction arrow) (81%)
- Bike parking at public transport nodes (78%).

The survey *Cycling in Newcastle* indicated that the one most strongly sought change to the network in Newcastle is the separation of bike lanes from traffic (p. 34). This theme was also evident in consultation undertaken for the Newcastle 2030 project.

## Confusing to the Bike Rider and Car Driver

Road rules are in place to ensure that road users know the safe way to operate together, however conflicting road rules and infrastructure design can cause greater safety issues and general confusion. Here we highlight two scenarios.

### Scenario 1: Car Door Lanes

Road rules require cyclists to use signposted bike lanes when provided, however this directly has an impact on cyclist safety. Many lanes are right next to parked cars.



Image 16 King Street cycleway, e.g. car door "death" lane. (Megan Sharkey)

## Scenario 2: Bike Icon on Road Pavement

Many bike pictures painted on Newcastle's roads are un-signposted and Road Rules 153, 144 & 247 advise not to ride in them because they are not proper bike lanes. Bike pictures on the road positioned where a parked car door opens is a very dangerous place to ride because of crashing into opening doors.

Likewise, the bike symbols near parked cars "show" motorists they are allowed to pass cyclists too closely, going against RMS recommended way to pass bicyclists which states:

When overtaking, give bicycle riders a safe amount of space. This means at least one metre to the side in a 50 km/h zone. If the speed limit is higher, bicycle riders need more space for their safety.

This gives 1m clearance in accordance with the "1m Matters" national campaign.



*Image 17 Honeysuckle drive cycleway on road with minimal buffer and still in car door lane. (Bernard Hockings)*

Whilst speculation, it is assumed most people don't go out of their way to find this on the road rules website, hence Newcastle motorists are influenced by the symbols of bikes on the roads which are 24/7 advertising that NCC/RMS are recommending passing closer than 1m. This effectively is creating a "pseudo" road rule, which is recommending motorists to pass within 1m of cyclists.

The bike symbols near parked cars effectively makes most cyclists think they must ride very close to parked cars, which goes against RMS recommendations which state "On your bike: Cycle about a metre away from the kerb to avoid debris and from parked cars to avoid opening doors."

This demonstrates the importance of an education campaign in accordance with the "1m Matters" national campaign.

The bike symbol is an example of working with council to improve safety standards. On March 6 2012 Newcastle City Council passed in Newcastle Cycling Strategy and Action Plan that an "Interim" solution for the old "car door death bike lanes," as described in Appendix 5 figure 1.2, was a "Wide Shared Lane (Mixed Traffic - Spacious Profile)" which includes bike symbols to the left hand side and bicycles between parked cars and driver. This went against the key objectives of the Strategy: "Section 3.2 to provide a safe, continuous and convenient bike network... that riders feel safe and comfortable using and to foster a culture that regards active transport as preferred choice for short trips."

This was not safe. Through advocacy and work of the cycling working party, the council staff agreed that this infrastructure was still not safe and every sign matters. NCC have since stopped painting bike icons near car door lanes. This is a great step.

But more is still needed. Better industry communication is needed as the recent R6 route has bicycle pictures in unsafe places but was due to a detour from construction and not painted by council. Updating plans and council documentation in the public realm and funding the CSN will assist this.

Additional road rules do allow places for children to ride, however also permit individuals ignoring courtesy to give other cyclists bad names. For example, it is illegal for cyclists to ride on footpaths unless younger than 12 or accompanying a child younger than 12. So adults are legally allowed to go 60km/hr down the footpath with their sons (the accompaniment anomaly seems a bit silly). Footpaths if ridden on should be done at a safe pedestrian speed more in line with mobility scooter legislation.

Many people think riding on footpaths is safer than a 40km/hr street. But they may not be fully aware of the risks of crossing intersections, and cars going in and out of driveways. NSW should have like Queensland, a rule allowing all cyclists on footpath and to give way to all pedestrians. This is NOT a reason to avoid building separated infrastructure, cyclists and pedestrians should also be separated wherever possible, but is a support tool that could be used to assist in connecting infrastructure.



### 8.4.1.3 CSN Risks and Opportunities

The current council strategy and previous practices over the last few years have undermined safety, and though stopped in practice by council, there are concerns about existing confusing bike symbols on roads impacting the CSN when more people start cycling. Increased cyclist and motor vehicle interactions on the road is ideal.

On the road we should be happy, harmonious, and non-discriminatory.

The CSN solution must get more people cycling. It is pointless building a CSN and not result in encouraging more cyclists, so **the perceived safety is just as important as the real safety**. CSN should be a fully separated, fully connected and signposted network. This will be considered safe by the whole community. Just look at the recreational cyclists that drive to Warners Bay, or the Fernleigh Track. They get their bikes out of their cars and ride on the shared paths.

In addition to the recommended paths we suggest additional removal of all confusing bike pictures from roads, integrating new learning into the next generation of motorists. The current generation has ingrained habits of passing cyclists too closely. It appears Australia Police blitzes have curtailed behaviour on a wide range of campaigns. So there is a risk not effectively counteracting the difference between the potential perceived safety of the CSN and the actual safety of it.

#### So where should bike signs go?

Bike signs showing correct clearances for car door openings and passing cars can be safe and will help educate the next generation of cyclists and motorists. However, the number one solution is separation.

#### How should bikes and cars interact if they need to?

Bikes and cars should interact under 30km/hr in low volume streets where motor vehicles are impeded from speeding.

### 8.4.1.4 Regulations and Fines

Across the world, regulations and fines vary, yet places where cycling modes are highest do have many commonalities. They include:

- No helmet laws
- Riding on the footpath
- Tax benefits for riding your bicycle

In New South Wales, regulations and fines were changed to reflect parity between cars and cyclists, listed below:

- Not wearing a helmet (from \$71 to \$319)
- Running a red light (from \$71 to \$425)
- Riding dangerously (from \$71 to \$425)
- Holding onto a moving vehicle (from \$71 to \$319)
- Not stopping at children's/pedestrian crossing (\$71 to \$425).
- Cyclists to provide 1 metre to pedestrians on shared paths
- Motorists to provide 1 metre to cyclists on roads

As pedestrians or cyclists, we are not the same risk to others as when we are motor vehicle drivers, however being on parity with cars enables a strong argument for equal funding as a percentage of mode share.

### 8.4.2 World Wide Infrastructure Development

Active Travel Infrastructure is designated as transport infrastructure and built as connected networks in places with the highest cycling modes. In addition to the case study list provided in Appendix D by the Faculty of Business, these cities have or are planning networks:

Figure 12 Case Study 1 San Diego USA

**CASE STUDY 1**

**SAN DIEGO, USA**

“The mobility plan calls for 9.3 miles of protected bike lanes and 5.5 miles of pedestrian greenways in the roughly two-square-mile downtown core. The plan defines greenways as expanded sidewalks, “that can serve as linear parks” that include benches, tables, trees and other landscaping. Additionally, the city plans to install new wayfinding signage and curb bulb-outs to shorten street crossings. All told, the city estimates the plan will cost just under \$64 million.

Perhaps a sign of how urban planning has evolved, the mobility plan specifically calls for the importance of creating a connected network: “Implementing the network as a whole, rather than individual segments, will improve the effectiveness of the cycleways and establish a well-connected grid of north-south and east-west protected bicycle facilities that can improve the safety and comfort for cyclists in Downtown.”<sup>43</sup>

Figure 13 Case Study 2 Chicago USA

**CASE STUDY 2**

**CHICAGO, USA**

According to the Chicago Department of transport a buffered bike lane costs about \$125,000USD per mile (\$169,814.24 per km) and a barrier-protected bike lane costs approximately \$200,000 USD/mile (\$271,702 per km).

The city next 50 miles of high quality bike lanes in addition to the 50 miles currently built at \$40 million, which built the first 50 miles and planning design of future bike paths. It was only an average of 0.4 % of CDOT annual capital budget. Funding will carry bike lane projects until 2019<sup>44</sup>.

Figure 14 Case Study 3 Lucknow India

**CASE STUDY 3**

**LUCKNOW, INDIA**

In India, states are racing to be the first to build a cycleway network. Lucknow, the 2nd largest city in north, east and central India after Delhi, and It is also the largest city in Uttar Pradesh is building a 270 km cycle network<sup>45,46</sup>. Cost is unknown.

Figure 15 Case Study 4 Ground Breaking Act , But No Funding

**CASE STUDY 4**

**GROUND BREAKING ACT, BUT NO FUNDING**

In 2013, the Welsh government passed the [Active Travel Act of Wales](#), which makes it a legal requirement for local authorities in Wales to map and plan for suitable route for active travel, and to build and improve their infrastructure for walking and cycling every year.” A collaborative report released in February 2016, Active Travel: The Start of the Journey, reviewed this Act stating the lack of funding provided to support the act was a direct cause of its failing and recommending funding it immediately. It noted a recent ministerial briefing showing current spending is at \$9.37AUD per annum (L5) whilst catch up expenditure to Netherlands’ investment would be \$37.46AUD (L2) and other UK cities are at \$18.73 (L10). A L10 investment at Welsh’s population (3,092,036) would be \$309,203,60.

# ROAD DIETS

The US Department of Transportation are undertaking a suite of programs, initiatives, and research to address the increasing number of pedestrians and cyclists killed each year, 4,735 pedestrians and bicyclists in 2013.<sup>47,48</sup> Road diets were one of "FHWA Every Day Counts (EDC) initiatives, in which FHWA works with state, local, and industry partners to deploy new innovations. Road diets help balance street space between vehicles, pedestrians, bicyclists and transit, and they can improve mobility and access for all road users, reduce crashes and injuries, and improve quality of life."

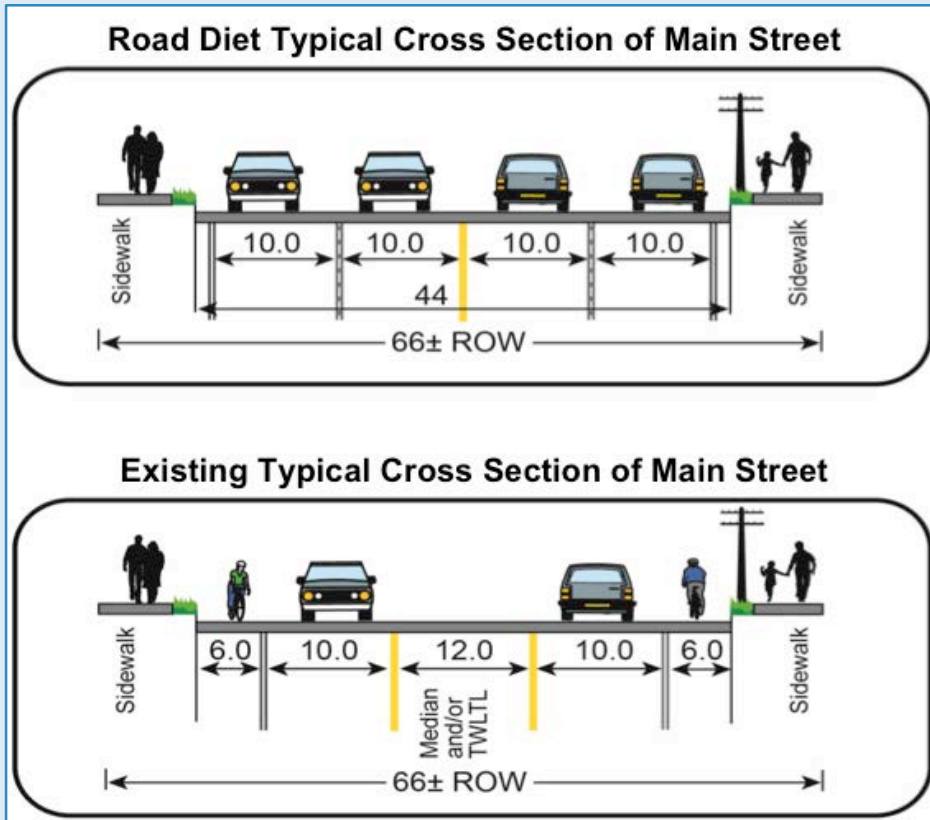


Figure 16 Road Diet found from Massachusetts Department of Transportation, USA.

### 8.4.3 Australian Infrastructure

This is a brief summary of some of the cycling projects happening across Australia. There are many more exciting projects, groups, and councils working towards active travel infrastructure. What differentiates the CSN is the big picture vision and possibility of a comprehensive research study.

Western Australia is switched on to a cycleway network, however they have struggled with funding. In 2012, the RAC found that Western Australia needed a \$388 million dollar investment for infrastructure and education to create a continuous comprehensive network<sup>49</sup>. The RAC recently noted most of the network still had not been built. Perth's infrastructure was found to be incomplete, lacked connectivity and had undesirable safety levels, by the Auditor general in October<sup>50</sup>, whilst the RAC found that half of Perth bike riders are afraid to be on the roads. The Auditor General found only half of the planned networks had been built and only 15% of the cycling infrastructure had been spent on priority routes.

In New South Wales, the City of Sydney has attempted to progressively build cycleways, but has been prevented on a number of occasions. When they have built separated cycleways, the design standards have been high. Image 18 shows the Campbell Street separated cycleway with a pedestrian crossing and parking located between the cycleway and traffic, in Sydney.

**Unfortunately, in many cities, this safe separated infrastructure has not been built, for example this on road cycleway in Adelaide.**



Image 18 - Separated Cycleway, Campbell Street, Sydney.

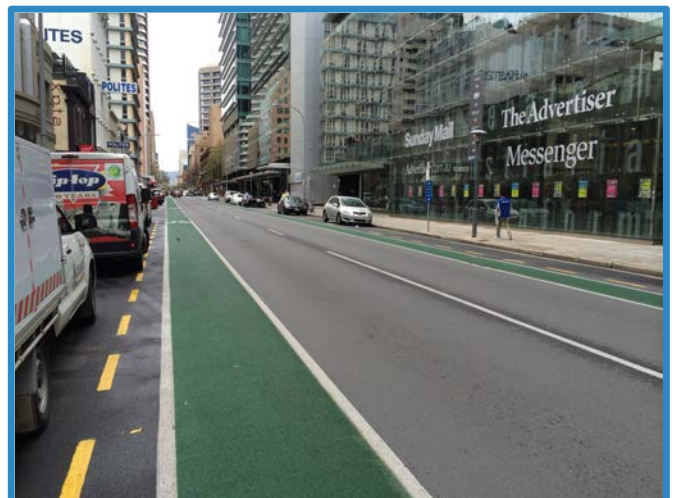


Image 19 Adelaide bike lanes. (Sara Stace)

#### 8.4.4 Mobility Independence

A liveable city has a well-developed quality of life, as determined by the quality and accessibility of education, infrastructure, culture, environment, safety and stability. Cities that generally score high on these criteria are connected and provide vibrant safe places for the community to socialize and be active.

Disconnected, unsafe and inadequate transport infrastructure can create social inequalities and community isolation. The current provision of transport infrastructure inadvertently excludes certain segments of the population. For example:

The NSW Disability Plan 2012—2017 acknowledges individuals with disability and the prevalence of their transport barriers, many of which are infrastructure related<sup>51</sup>. Seven programs are being implanted to target this, two are listed below:

- Easy Access - to provide commuters with easily accessible stations and to comply with Transport Standards
- Interchange Upgrades - focusing on works that increase connectivity between transport modes

Wheelchair users have difficulty being independent due to non-existent or non-compliant infrastructure, for example curb lips or lack of ramps.

Other independence barriers such as those without driver's licences like teenagers, some mobility disabled, and those who cannot afford to run a car who have to rely on often poor and inconvenient public transport services. With the revitalisation, an improved public transport network and active transport infrastructure, an opportunity exists to create independence. If safe cycling infrastructure was available to provide convenient and normative mode of transport for trips up to 10km, life would be a lot easier for people in these circumstances.



Image 20 Grace uses an electric trike to assist with her mobility for her walking disability. (Sara Stace)



Image 21 Kurt Fearnley getting fitted for a kid seat in Newcastle, Instagram. (Sara Stace)

## 8.5 Active Travel

### 8.5.1 Global Trends in Cycling

Cycling has seen a renaissance across the globe. The freedom, mobility, and physical strength cycling enables continues to see the sport grow worldwide.

A snapshot of some of the worldwide trends in cycling:

- In the USA between 2001 and 2009, young people increased cycling by 24%, walking by 16% and public transport trips by 40% (statistic extracted from Albesco, reporting that in New York, a 2014 study, showed that women cycling had a doubled over in the four years since separated infrastructure had been constructed<sup>52</sup>.)

### Local Trends in Cycling and Walking

In the 1940s and 1950s thousands of workers would ride daily to the steel works and even in recent decades the proportion of trips made by bike has been double the state average. Newcastle is the ideal test case to demonstrate that it is possible to make cycling safe and attractive enough to create a mode shift of a minimum of 5% to 15% of urban trips on to bicycles. The local area offers a mild climate and gentle topography on the New South Wales coastline, trip distances are short with 40% are less than 2km, and 80% are less than 10km, and lack the intense traffic pressure of larger cities, though the population growth could change that without any changes in planning and infrastructure decisions.



Experience in many jurisdictions shows that safe quality cycle paths deliver results. The Fernleigh Track has proven this success becoming a popular recreational and commuter cycling route. Suburbs close to the Throsby Creek cycleway have 6% of trips to work by bike compared with 2% across the Newcastle LGA. The installation of a signalised crossing in 2013 at Hannell St caused an immediate increase in cycling on this route.

### 8.5.2 End of Trip Facilities

Think about your car for a minute. When you go to a shop you want a place to park that is safe and secure. It will enable to you walk from your personal vehicle preferably on a hard surface, in a well lit area on your way to the shop. You wouldn't want to park in a dark alley, in gravel or dirt, or worse have no parking at all. Best practice parking is about demand management, space efficiency, and appropriate level of service amenities required. At your home, you want to be in front of your door and have security for your vehicle.

Bicycle parking works the same.

Bicycle parking embedded into infrastructure design with consideration for the type of bicycle user utilising that infrastructure and the purpose of their journey. Identify who uses it, how they use, when they use, and passive surveillance available will determine the type of facility and level of amenity provided. For example, the parking required in a commercial office is much different from a residential building. A residence may have multiple bikes, make repeated trips on the weekend, or require a maintenance area. In contrast, commercial buildings are tailored to commuters, they come once in the morning and leave in the evening, yes a short stay street parking may also be required, but the bulk of the users will be workers in that building. The commercial building may require showers or lockers in a shared use space or prefer individual tenants provide their own. Council will require updating their development control plans to support the bicycle parking and businesses will want to provide those amenities or risk losing a competitive edge.

### How to estimate bike parking

Imagine needing an entire parking garage just for bikes. Evaluating how much bike parking will be necessary to support a 5% cycling mode share can be difficult with limited data. Viennese Transport policy calls for a 10% mode share in cycling, which spurred the local Vienna University of Technology, Institute of Transportation to research how many bike parking spaces would be necessary to facilitate that mode share.



Image 22 Temporary bike parking packing out Wheeler Place. (Bernard Hockings)

### Current CSN End of Trip Facilities

The local public transport interchanges or major stops all have inadequate cycle infrastructure. Places like Charlestown Square, John Hunter Hospital, Kotara Shopping Centre should have state of the art facilities rather they have limited to nothing.



Image 23 Short term parking (Altinova)

## CSN RECOMMENDATIONS

A variety of end of trip facilities (ETF) will be needed to support active travel infrastructure. As previously shown, places with strong active travel modes shares have ETFs at public transport interchanges, businesses, public facilities and within local development control plans.

### Public Transport

ETFs at public transport interchanges require short and long term parking flexibility.

Short term facilities should be covered, open with good foot traffic visibility.

Long term parking at public transport interchanges requires secure parking and lockers that can be integrated together or stand-alone (figure xx. Stand alone facility). A stand along facility, for example parking in one facility and showers, lockers and toilets in another, may be more encouraging to pedestrians or wheelchair user.



Image 24 Keolis Downer Gold Coast light rail network (PFL spaces)

### Councils

Local Councils should consider secure cages within all council parking garages. This would maximise space and assists businesses where it is difficult to retrofit. In addition, this space could be charged 1/6<sup>th</sup> the rate (1/6<sup>th</sup> the space) for the parking. It's easy to retrofit and provides immediate wins for the council.

Development Control Plans in council would be amended to reflect new bicycle parking requirements. Schools be required to provide bike parking facilities and multi-storey residential required to provide a mix of bicycle parking spaces.

Businesses should support etfs because its good for their bottom line. A parking spot costs cc. Business can save with reduce overheads.

Commercial property can provide shared facilities of individual facilities at a premium to larger clients.

## 8.6 Health

### 8.6.1 Physical Health Research

Epidemiologic studies have repeatedly shown that being physically active has a positive effect on health, but it has only been in the last decade that this association has been examined using objective measurements of physical activity. The older research all used self-report questionnaires, which are prone to reporting biases such as social desirability (people report what they would like to do rather than what they actually do) and judgement error (one person's strenuous exertion is another person's walk in the park). Recent studies, such as the one in the box below, have used step counters for a more valid and precise record of physical activity, and been able to accurately examine the dose response relationship between activity and health markers.

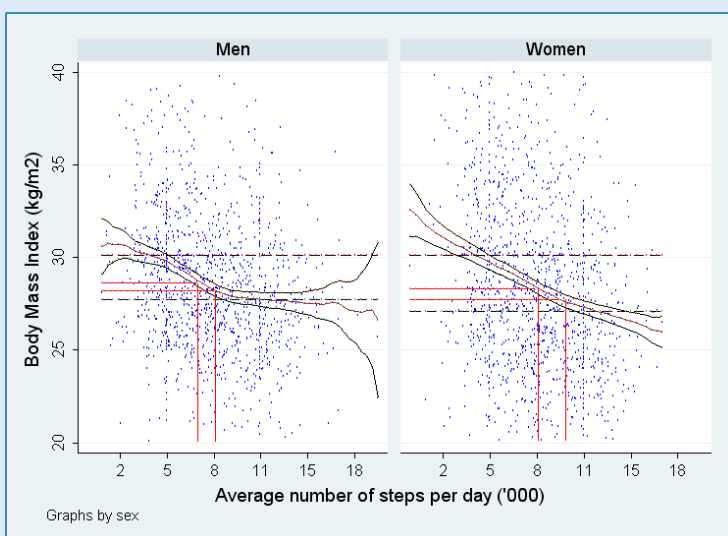
For not only BMI but for many other health indicators including inflammatory makers, lipid levels, and even depression scores, the steepest part of the dose response curve is at the left. The implications of this are that anything that gets inactive people moving has large health benefits, and public policy should be aiming to shift the least active group to some activity rather than focussing on those ready for high level activity such as sports. Active travel solution fits this problem well, as everyone needs local travel but not everyone is motivated to be physically active for their health.

While the benefits of physical activity are well known for cardiovascular disease and diabetes, it is much less well known that physical activity has large effects on the prevention of cancers and dementia. These diseases have long lead times and less understood risk factors, so the exact dose response relationship of these associations is not as well understood.

The health sector response to sedentary lives is weak and ineffective. An intensive one to one coaching intervention by exercise physiologists showed an average increase of 1000 extra steps per day, the equivalent of walking for ten minutes or just 800 metres. Treating inactivity via the health system requires ongoing input by expensive health professionals. The same benefit can be had with no ongoing cost through provision of active transport policies.

In places where the health outcomes of different urban travel habits have been studied, the results have been spectacular, though such studies have only been done in Europe. For example, a Copenhagen cohort study showing a 27% reduction in all-cause mortality for commuter cyclists when compared with other commuter types (i.e. drivers, public transport users, etc.) when followed up with for more than 20 years. This study's results were not due to socio demographic variables or leisure time sports participation as these were adjusted for in analysis.

Figure 17 University of Newcastle's Hunter Community Study



The Hunter Community Study used step counters to examine the relationship between physical activity and body mass index in 2400 local people over the age of 55 years.

In women, any exercise is good exercise, and the more the better.

In men, the effect of exercise on BMI flattens out at about 9000 steps per day.



### 8.6.2 Local Health

In New South Wales, 41.7% of the population is overweight and 26.5% are obese. Newcastle and Lake Macquarie though are the fourth worst performing region in the state according to the Heart Foundation’s 2015 Australian Heart Disease statistics which show that 35.1% are overweight and 31.5% obese. New South Wales has far too many people who are sedentary and the state requires immediate action to get people moving daily.

Avoidable mortality for Newcastle and Lake Macquarie LGAs is higher than for NSW as a whole. Data is available at the geographic level of population health areas by specific causes as shown in figure 18. Preventable mortality is a health indicator defined in the National Healthcare Agreement 2015, and standardisation removes the effect of differences in age. The local area is in the middle of an epidemic of sedentariness and obesity, not unlike the rest of NSW, that the health system cannot effectively respond to. This is flowing through to high levels of avoidable mortality that needs a public health response to intervene to get people active across the lifespan.

Figure 18 Avoidable mortality in people 0-74 years by specific causes, as a standardised rate compared to Australia as a whole. I.e. -4 is 4% less than the average Australian rate and +4 is 4% more than the average Australian rate.

| LMCC and NCC areas linked by the CSN | Avoidable Cardiovascular Disease | Avoidable Cancers | Diabetes |
|--------------------------------------|----------------------------------|-------------------|----------|
| Hamilton Broadmeadow                 | +54                              | -4                | Unknown  |
| Adamstown-Kotara                     | +6                               | -45               | Unknown  |
| Merewether-Newcastle                 | +21                              | -4                | +132     |
| Stockton-Fullerton Cove              | +19                              | +35               | Unknown  |
| Mayfield-Warrabrook                  | +28                              | -28               | Unknown  |
| Beresfield-Jesmond                   | +37                              | +93               | +29      |
| Fletcher-Maryland                    | +63                              | +25               | Unknown  |
| Wallsend Elermore Vale               | -11                              | +26               | Unknown  |
| Cardiff- Glendale                    | +9                               | -9                | Unknown  |
| Warners Bay-Booloroo                 | -38                              | +14               | Unknown  |
| Mt Hutton-Windale                    | +90                              | +11               | +183     |
| Belmont-Bennets Green                | -3                               | +24               | +85      |
| Charlestown-Dudley                   | -11                              | +23               | +23      |
| Belmont South-Blacksmiths            | +68                              | +47               | Unknown  |
| Bolton point-Teralba                 | +54                              | +51               | Unknown  |

### NSW Activity Levels in Females and Males 18 years and older

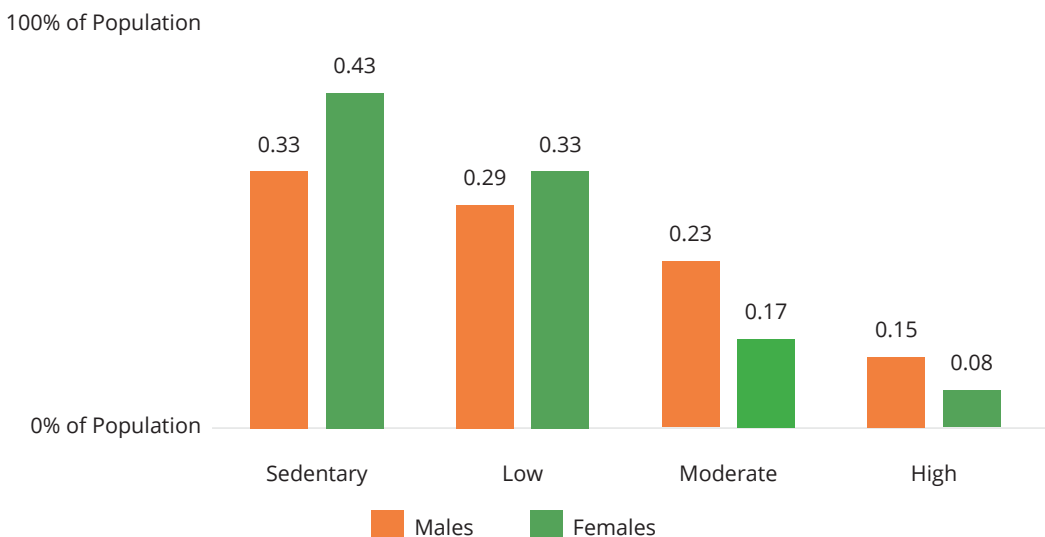


Figure 19 NSW Activity Levels in Females and Males

### 8.6.3 Children's Health

Children are our future. One day they will run the country, but in what shape? Over the last 30 years the prevalence of overweight and obese children has been increasing. The NSW Government Healthy Children initiative aims to actively improve children's health and regularly monitors the progress of interventions through the Schools Physical Activity and Nutrition Survey (SPANS), which, unfortunately, at the time of this release the 2015 data, was unavailable. The SPANS data in the graph below shows the trend in prevalence of overweight and obesity for boys and girls<sup>53</sup>. The program to date has focused on healthy eating at school programs and recent initiatives have begun to develop active travel programs and resources for schools. Walking or cycling to school is however unlikely if there is no safe route for children to take.



Image 25 Lyn Lipple carrying new twins in trailer. (Sara Stace)

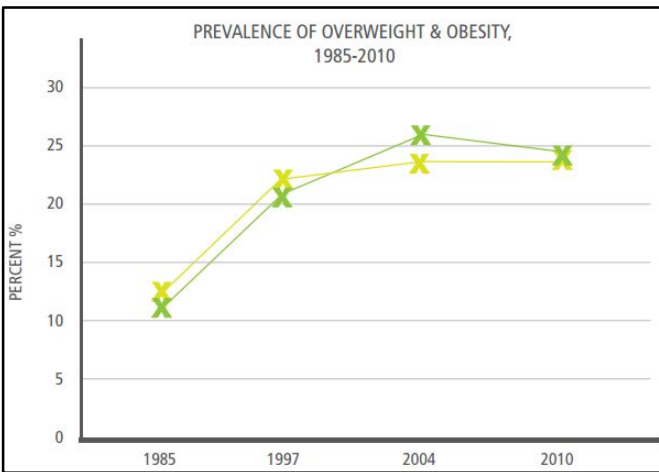


Figure 20 Prevalence of Overweight and Obesity according to the NSW Government Health

### According to NSW Government Health<sup>54</sup>, in 2010, even primary school kids are sedentary

Less than half of Years K, 2 and 4 students spent 60 minutes or more per day in physical activity. Boys (50.5%) were more likely to do so than girls (42.2%), but large numbers of young children failed to reach the minimum time required to have a positive health effect.

The CSN is designed to facilitate active travel to school by linking as many schools as possible. As shown in figure 21 a large number of schools are either directly on a CSN segment or can be linked by a short connector path.

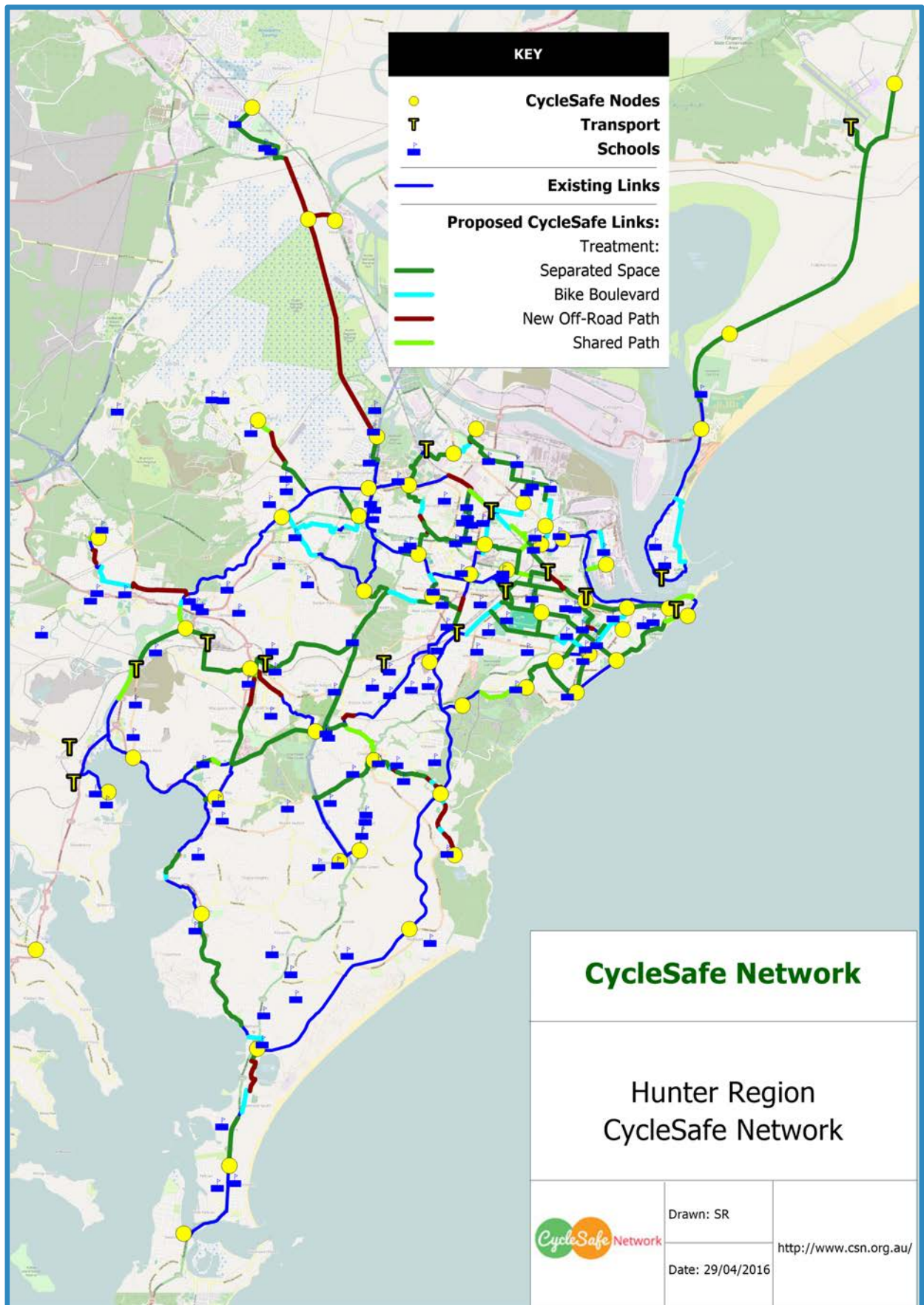


Figure 21 Proposed CycleSafe Network with nearby school

#### 8.6.4 CSN Health Economic Benefits

##### Blueprint for an active Australia found<sup>55</sup>:

- “Observational studies have consistently shown that children who walk or cycle to school engage in more physical activity than those who travel by other means.
- Commuters who use public transport engage in more physical activity than car drivers.
  - For example, public transport users in Melbourne achieve over 40 minutes of incidental exercise a day, compared with less than 10 minutes for car users.
- The odds of achieving 10,000 steps per day were 3.55 times higher in a study of university students who commuted by public transport, compared with drivers.
- One study found that women who increased their walking distance and speed lowered their risk of cardiovascular disease, type 2 diabetes and all-cause mortality.”

Previous research indicates most of the economic return from this investment will accrue from reduced demand for public health services.

This will be especially evident amongst the young people, who lead increasingly sedentary lives, and are missing out on the physical and mental health benefits, as well as, independence to grow which a safe cycling environment would provide.

How to value mortality?

Using the Statistical Value of a Year of Life, a value can be put on the observation that cyclists have greater life expectancy than non-cyclists. The basis of the statistical value of a year of life has been questioned by some authors, but it is accepted as standard practice in Australia, and the value to be used is set by the Department of Prime Minister and Cabinet.

The European office of World Health Organisation has produced a health economic assessment tool (HEAT) for walking and cycling projects, based on the value of reduced mortality of cyclists aged 20 to 64 years documented in some large European cohort studies. The first phase of construction of the CSN based on the nine segments most advanced in the council’s planning process would link up a population of 122,653 ABS data at the geographic SA2 level. If cycling mode share in these areas increased by 5% more than current, and people rode 10 Km per day on weekdays only, the annual value of the health gains according the WHO method would be \$14.3 million per year<sup>13</sup>.

For example, the eight segments of phase 1 comprise approximately 30 Km, so even the construction cost of \$1 million per Km the capital cost is recouped by only 2.1 years of health gains predicted by the WHO method if building the network induces a 5% mode shift. Bicycle mode share observed around Throsby creek are 8%, so benefits could be potentially much greater. The costs due to injury are likely to be less than predicted in these analyses, as the principal design feature of the CSN is to provide safe cycling routes. The risk of injury per bicycle kilometre goes down as cycling becomes more common.

## 8.7 Environmental



Image 26 Newcastle Coal Port. (Bernard Hockings)

There is a clear link between a reduction in car-dependence and better air quality. Plus, international motivation to ensure we shift from fossil-fuel dependence and car-reliance, and identify ways to move around effectively as evident by the recent Paris Climate Change Agreements. Behaviour change is one part of the shift, however supportive built environments, which encourage change is another part. Supportive infrastructure is critical for these shifts to occur.

Australian congestion is costing the economy in productivity and health. Without action, the cost of congestion across our biggest cities is projected to increase from \$13.7 billion in 2011 to \$53.3 billion in 2031.

A bicycle can save an average of 1500 kilograms of carbon emissions per 10km travelled. A bicycle:

- Minimises the wear and tear on roads,
- Reduces the need to build and services the private motor vehicle
- Reduces air pollution locally
- Reduces congestion
- Reduces financial burden on families who cannot afford a private motor vehicle.

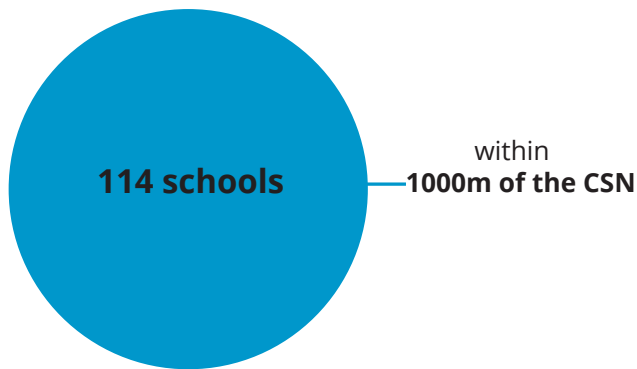
Cities across the world have been taking the car free challenges with great results reducing air pollution overnight. Many cities such as Oslo, Paris, Munich and more are planning car free CBD's.

## 8.8 Teaching and Learning

Once built, the CSN will increase access to safe cycling as a way for all to get around. In doing so, it is well accepted that access to infrastructure must be accompanied by education, skill-based training, and promotion of use and safe practice in order for the behaviour change to occur.

### 8.8.1 Schools on the CSN

#### CSN Schools within 1 kilometer of network



#### CSN Phase 1 Schools within 1 kilometer of network.

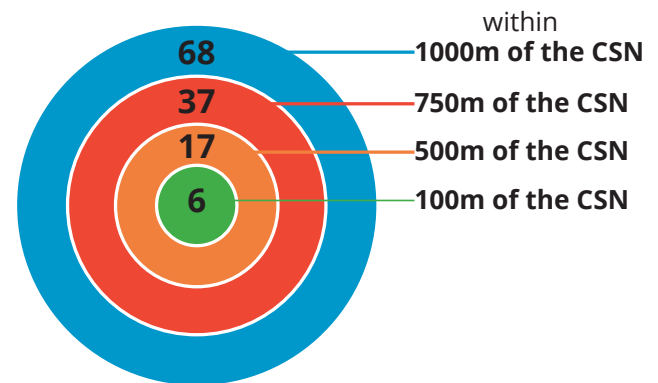


Image 27 Children riding home from school on the Newcastle foreshore. (Bernard Hockings)



Image 28 Dropping kids off at school in a cargo bike then heading to work. (Sara Stace)

### 8.8.2. Cycling Education

Cycling education will be required for adults and children. Adults will most likely need to regain confidence to undertake frequent non-recreational riding, learn routes, and helpful manners on the cycle lane or shared path.

Children offer the greatest opportunity for cycling education. Cycling education in schools is an important part of building confidence and the skills necessary to ride to and from school. It can promote positive travel behaviour and rules whether you walk, ride, scooter, drive or use public transport. Physical education classes can incorporate cycling education or utilise as mini workshops. Children as young as 5 can start with education. It should be noted that whilst these programs will be necessary to help moderate behaviour, teach manners and road rules, encouraging healthy habits from the parents at a young age will go further than any school-based intervention programs in isolation.

### Community and Road Education Scheme (CARES) Program

The Central Coast Lifetime Learning Centre (CLLC) has a full road education facility for children, hosting the Community and Road Education Scheme (CARES) Program, which is a road and bicycle education program for Years 5, 6 and 7 school groups, supporting the NSW Department of Education and Training Personal Development, Health and Physical Education syllabus.

Each student is issued with a licence at the beginning of the program. A mix of classroom and outdoor lessons covering safe and basic cycling skills and road rules, plus an on the road environment training track which features a roundabout, traffic lights and other 'real life' road characteristics. Throughout the day, students' behaviour is monitored by the Police Officers, two NSW officers are appointed to centre, with points deducted from licences for breaking of road rules, like hand signals or traffic lights. If students lose all their points, they're no longer permitted to ride their bicycles and must complete alternative work providing an introduction to a 'demerit point' system, as utilised for motorists' licences<sup>56</sup>.



Image 29 Road education facility at Speers Point Park. (Megan Sharkey)

### 8.8.2.1 Lake Macquarie City Council Education Offerings

From May 2014 to Nov 2015, LMCC held 35 workshops at 15 schools with approximately 786 children participating.

Extremely popular, certified instructors set mini courses with road signs, pavement markers and temporary roads. Children practise learning hand signals, road symbols, and watching for others, at the same time as getting a little exercise.

This program will continue in 2016.

### 8.8.2.2 Newcastle City Council Education Offerings

Newcastle Council has recently announced cycle safe education classes as this report is being finalised. This will be a combination of local discovery rides, beginner and intermediate safe cycling workshops.

### 8.8.2.3 Road Safety Messaging

Lake Macquarie Cycling Strategies recognised the need for education for cycling safety as a means to encourage cycling. Lake Macquarie council undertook the development of a road safety video message that was very well received by the industry, coinciding with legislation regarding road safety culture. However, this message will still require funds to see it receive air time before it will lead to road culture change.

### 8.8.2.4 Racing Clubs

The CycleSafe Network is about cycling for everyone and not a specific group of people. In the media over recent years it is the road racing users, e.g. "Lycra" warriors, who often bear the brunt of negative media, abuse on the road, and become the generalisation for all cyclists. Whilst majority of racing clubs promote and practice safe riding behaviours including fining individuals for not adhering to shared path rules and riding dangerously, accidents have occurred locally between racing cycleway users and non-racing users of shared paths. This is a very infrequent occurrence that often gets an unfortunate sensationalised spotlight.

Road cyclists have limited training areas and whether they are on the road or path are often seen as out of place. For example, the Fernleigh track is popular to all users and has created a congestion.

If more paths were available and infrastructure, which separates different active travel needs these interactions would decrease, plus general education of behaviours on these paths.

In the Hunter, there are three Cycling NSW affiliated racing clubs, all of whom must have development coaches as part of their affiliation agreement, which the position tends to be primarily about racing skills.



*Image 30 Close pass by vehicle on road with no cycleway or shoulder. (Alan Corvy)*



## 8.9 Economy

Economic decisions are usually at the forefront of any decision for almost everyone.

How much will the return on investment be?

When you do show that return on investment, the counterproductive questions/statements, like “ it won’t work here” or “political influence sways the decision another way”. Interestingly, to counteract these, across the globe governments that have been implementing active travel infrastructure and policies, as positive return on investments not only in the difficult to measure items like social and health benefits, but the real return on investment.

### 8.9.1 Impacts across the globe

#### Europe winning on Health and Tourism dollars

The European Cyclists Federation coordinates the EuroVelo network, which is signed, numbered, mapped, well promoted and supported by numerous governments across the continent. The European Cycle Route Network economic impact study conducted in 2012 was funded by the European Parliament and shows an impact of \$57 billion from 2.295 billion bicycle tourism trips taken on EuroVelo routes<sup>57</sup>.

In June 2013, ECF released another study: Calculating the Economic Benefits of Cycling in EU-27 (PDF) which takes into account everyday cycling and its health benefits. ECF estimates this impact to be well above \$265 billion annually, or more than \$530 for every person that lives in the EU.

Additional studies can be found through the Adventure Cycle Association who provided an excellent annotated bibliography with Europe examples noted above<sup>58,59</sup>.

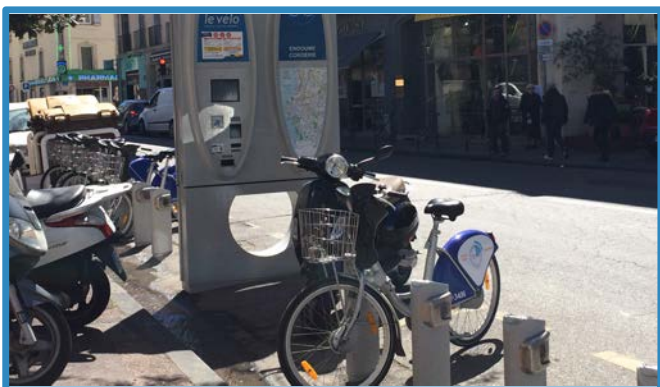


Image 32 Bike Share Scheme, Europe. (Megan Sharkey)

#### New Jersey, USA

A New Jersey Business report found a \$63 million dollar investment in 2011 contributed a total of \$497.46 to the New Jersey economy in that same year. Nearly **8** times the estimated investment. Plus, it supported 4,018 jobs with \$153.7 million of the total in compensation. \$63 million invested in infrastructure that year.<sup>60</sup>

#### USA Tourism

The Adventure Cycle Association provide a great overview of a plethora of economic tourism information and reports. A few are excerpted here, however the full-annotated bibliography is in Appendix E- Appendix Tourism Benefits Extract from Adventure Cycle Association.

#### Victoria, Australia

Growing Cycling Tourism, the recent Austrade Cycle Tourism 2015 Victorian research report found cycle tourism users wanted:

- Downloadable maps (38%),
- Connected cycle paths and trails (37%),
- Accessible online information (37), and
- Planning information for a trip (36)<sup>61</sup>.

They also research NSW the perception of NSW regarding cycle touring. Interestingly, NSW is ranked number 2 behind Victoria in cycle touring destinations though we lack substantial safe cycleway or rail trails.



Image 32 Chinese student touring Australia by bicycle before studies finish. (Megan Sharkey)

### 8.9.2 General Benefits

Developing these safe cycleways assets as a connected quickly built network, will give our city an Australian a first, commuter status in a paradigm shift which is happening globally. Locally and regionally, in addition to the health benefits of the CSN, the ongoing additive economic returns come from:

- Increased “spend” by customers who can access businesses via safe cycleways
- Enhanced “activation” of urban spaces by designing them for people and not cars
- Anticipated increase in tourism directly related to the CycleSafe Network and its connection to the proposed Richmond Vale Rail Trail and other attractions.



*Image 33 Pedicab business parked at Wheeler Place.  
(Bernard Hockings)*

# CSN ECONOMIC EVALUATION



The CSN economic potential could be significant when considering the variety of indices it affects such as health, mobility to work, disposable income, property value and more. Governments have not historically given much weight to active travel costs benefits and often debate the merit of such economic critiques.

Through applying for the Hunter Infrastructure and Investment Fund, the CSN steering committee identified that this proposal had the opportunity to address some of the perceived and real issues of economically evaluating active transport infrastructure. The opportunities identified were:

1. providing a realistic basis for cost benefit assumptions to be made
2. strengthening the cost benefit tool standard for bicycle per kilometre benefit
3. develop a qualitative risk framework to support the cost benefit analysis in places where baseline data is insufficient.

## 1 PROVIDING A REALISTIC BASIS FOR COST BENEFIT ASSUMPTIONS TO BE MADE

“How do you know how many people will cycle?” was often the first question asked.

This assumption is difficult. We do not have local Australian data on what makes individuals shift modes from cars to cycling, e.g. their attitudinal change. Internationally, studies have looked at this and anecdotal evidence locally shows that when active transport infrastructure is provided cycling mode share numbers increase, “but that doesn’t mean it will here” is often the response.

Local and State governments have a target to double mode share of cycling in regional areas, and a stated target of 5% mode share in cycling not just locally in Newcastle and Lake Macquarie, but in nearly all major cities in Australia. Five-percent mode share in cycling is our assumption. By utilising the tool with a 5% target we are able to understand the risks and benefits in reaching a 5% target in cycling, provide a preliminary cost benefit of the State government’s own objective and own valuation of their objective. This is effectively a costed plan.

## 2 STRENGTHENING THE COST BENEFIT TOOL STANDARD FOR BICYCLE PER KILOMETRE BENEFIT

With such a great perceived benefit there is still much debate surrounding the bicycle per kilometre benefit. The second opportunity is to strengthen the benefit per kilometre cycling found in cost benefit analysis. In order to do so, a team from the UON Faculty of Business undertook a critique of the prevailing active travel cost benefit analysis in Australia proposing an integrated risk management alternative (Appendix H).

This critique identifies the baseline data that is insufficient or not statistically valid and proposes an approach for strengthening it where necessary.

The research proposed around the CSN would look to strengthen these numbers and provide statistically valid data.

## 3 DEVELOP A QUALITATIVE RISK FRAMEWORK TO SUPPORT THE COST BENEFIT ANALYSIS IN PLACES WHERE BASELINE DATA IS INSUFFICIENT

Why is baseline data insufficient? Cost Benefit Analysis for Active Travel within Australia has relied on the Price Waterhouse Coopers report from 2009 quantifying the benefit bicycle per kilometre travelled. This report, the subject of the critique of the guidelines for economic appraisal, left questions as to how that number was generated.

In order to generate a baseline for quantifying active travel, first we must provide the framework for understanding decisions of *why* people choose to travel activity, and more importantly, those who are not doing so, *what* makes them change.

## 9.1 Critique of the Guidelines for Economic Appraisal

In every application for funds, a cost benefit analysis must be applied. The CSN group during our investigations into the Hunter Infrastructure Investment Funds realised some inherent flaws in the way we evaluate active transport infrastructure. Engaging the Faculty of Business and HMRI we sent out to understand how Cost Benefit Analysis derive the monetised costs for bicycle per kilometre travelled.

The critique evaluates the appropriateness of Cost Benefit Analysis (CBA) as a means of evaluating the Cycle Safe Network (CSN), and concluded with suggestions of how an integrated risk platform provides a better method of assessing the subjective, socio-environmental consequences of CSN. In evaluating CBA, a review of a number of reports on cycling, which employed CBA to evaluate the social benefits of tax-payer funded public projects, was undertaken. Reports include Transport for NSW's (2013) bike facility excel tool which assessment monetises the benefits and costs of cycling tracks even though there are no objective market values for many of benefit-attributes.

More specifically, section 1 provides background on the genesis of CBA and critiques the growing popularity of CBA as a tool for evaluating all forms of projects including publicly funded projects that generate benefits that cannot be objectively quantified in monetary terms. Section 2 is a review of Transport for NSW's use of CBA to evaluate cycling tracks which is posited within section 1's larger critique of CBA. Section 3 goes further: it evaluates 4 major line-items in CBA methodology that underpins the following reports/publications on cycling: Rissel et al., (2013); Price Waterhouse Coopers (2009); Road Traffic Authority (2003) with Transport for NSW (2013); World Health Organization (2011). Based on the theoretical and practical evaluations of CBA in sections 1 to 3, the final section recommends using socialised constructions of risk to evaluate CSN, and to provide relevant monitoring-information on how the progressive roll-out of CSN affects community attitudes on increasing physical activity.

The full report may be found in Appendix H.

## 9.2 Bike Facility Tool by Transport for New South Wales

The numbers indicated by the Bike Facility Tool by Transport for New South Wales are astronomical and will receive debate regarding their authenticity. Whilst we caution the reader in taking its output as the actual benefit we will receive when built, this exercise was imperative for testing our critiques, thus enabling a research proposal to strengthen those numbers and allow for a statistically valid baseline and qualitative framework.

### What should not be part of the debate is that the benefits of active travel exist and would have a significant positive effect on the community.

Scenarios 1 to 4 represent different aspects of the CSN, from the full CycleSafe Network to the Phase 1 route only. In each scenario, the veracity of these monetised rates could not be independently evaluated because of lack of information about underlying assumptions; again this is a problem of the cost benefit analysis critiqued.

Scenario benefits used as per the TfNSW tool.

Figure 22 Scenario benefits used as per the TfNSW tool.

| Benefits - as per "input items" inTfNSW (2013):   | Monetised rates of benefit per km cycled (bicycle km in TrNSW, 2013) |
|---|--|
| 2.1) Health   | \$1.050 per km cycled  |
| 2.2) Congestion savings   | \$0.290 per km cycled  |
| 2.3) Roadway Provision cost savings   | \$0.040 per km cycled  |
| 2.4) Parking Cost Savings   | \$0.013 per km cycled  |
| 2.5) Vehicle operating cost savings   | \$0.270 per km cycled  |
| 2.6) Tolling cost savings   | \$0.360 per km cycled  |
| 2.7) Noise from cars  | \$0.010 per km cycled  |
| 2.8) Air pollution form cars  | \$0.029 per km cycled  |
| 2.9) Greenhouse gas emissions   | \$0.0229 per km cycled   |
| 2.10) Water pollution   | \$0.0044 per km cycled   |
| <b>Total Benefit Possible</b>   | <b>\$2.0893 per km cycled</b>  |
| Expected cost of construction to integrate existing cycling tracks and build the full CycleSafe Network = \$163,943,000.                                |  |
| This cost benefit analysis is represented as the number of years required to recoup costs of incremental construction costs/monetised benefits per year |  |

## 9.2.1 Scenario 1: 5% of general population bicycles for travel

### Scenario 1: 5% of general population bicycles for travel

Assumptions:

#### 292,682 people within the CSN catchment

- 5% population = 14,634 persons
- Estimated travel based on Household Travel Survey trips per person x 9.4km per trip x 251 weekdays per year = 132,240,170 km cycled.
- 3.14 trips per person x 9.4km per trip x 104 weekends per year = 44,921,463 km cycled.
- Total incremental kilometre cycled 177,161, 633 km

| Benefits – as per "input items" inTfNSW (2013): | Total anticipated monetised benefit |
|---|-------------------------------------|
| 2.1) Health                                     | \$186,019,714.60                    |
| 2.2) Congestion savings                         | \$51,376,873.57                     |
| 2.3) Roadway Provision cost savings             | \$7,086,465.32                      |
| 2.4) Parking Cost Savings                       | \$2,303,101.23                      |
| 2.5) Vehicle operating cost savings             | \$47,833,640.91                     |
| 2.6) Tolling cost savings                       | \$N/A                               |
| 2.7) Noise from cars                            | \$1,771,616.33                      |
| 2.8) Air pollution form cars                    | \$5,137,687.36                      |
| 2.9) Greenhouse gas emissions                   | \$4,057,001.40                      |
| 2.10) Water pollution                           | \$779,511.19                        |
| <b>Total Benefits per year</b>                  | <b>\$306,365,611.52</b>             |
| <b>Estimated Payback Period</b>                 | <b>6.42 months</b>                  |

## 9.2.2 Scenario 2: Employed people aged 15 years and over

### Scenario 2: Employed people aged 15 years and over

Assumptions:

#### 122,653 people within CSN catchment

- 5% population = 6,132.65 persons
- Travel to and from work 5 x a week at less than 10km
- (2 trips per person x 9.4km per trip x 251 weekdays per year) = 28,938,748.82 km cycled.

| Benefits – as per "input items" inTfNSW (2013): | Total anticipated monetised benefit |
|---|-------------------------------------|
| 2.1) Health                                     | \$30,385,686.26                     |
| 2.2) Congestion savings                         | \$8,392,237.16                      |
| 2.3) Roadway Provision cost savings             | \$1,157,549.95                      |
| 2.4) Parking Cost Savings                       | \$376,203.74                        |
| 2.5) Vehicle operating cost savings             | \$7,813,462.18                      |
| 2.6) Tolling cost savings                       | n/a                                 |
| 2.7) Noise from cars                            | \$289,387.49                        |
| 2.8) Air pollution form cars                    | \$839,223.72                        |
| 2.9) Greenhouse gas emissions                   | \$662,697.35                        |
| 2.10) Water pollution                           | \$127,330.49                        |
| <b>Total Benefits per year</b>                  | <b>\$50,043,778.34</b>              |
| <b>Estimated Payback Period</b>                 | <b>39.31 months (3.28 years)</b>    |

### 9.2.3 Scenario 3: 5% of Children 5-19 trips to educational facilities

#### Scenario 3: 5% of Children 5-19 trips to educational facilities

Assumptions:

#### 63,220 total 5 to 19 year olds within LGAs

- Trips per person x 200 days a year
  - o 5 to 9 year olds
  - o 1,005 persons
  - o Travel less than 2km to school
- 1,009,020 km cycled
- 10 to 19 year olds
  - o 2,157 persons
  - o Travel less than 5km to school
  - o 5,414,070 km cycled

| Benefits – as per "input items" inTfNSW (2013): | Total anticipated monetised benefit |
|---|-------------------------------------|
| 2.1) Health                                     | \$5,373,900                         |
| 2.2) Congestion savings                         | \$1,484,220                         |
| 2.3) Roadway Provision cost savings             | \$204,720                           |
| 2.4) Parking Cost Savings                       | \$66,534                            |
| 2.5) Vehicle operating cost savings             | \$1,381,860                         |
| 2.6) Tolling cost savings                       | n/a                                 |
| 2.7) Noise from cars                            | \$51,180                            |
| 2.8) Air pollution form cars                    | \$148,422                           |
| 2.9) Greenhouse gas emissions                   | \$117,202                           |
| 2.10) Water pollution                           | \$22,519                            |
| <b>Total Benefits per year</b>                  | <b>\$8,850,557</b>                  |
| <b>Estimated Payback Period</b>                 | <b>18.5 years.</b>                  |



## 9.2.4 Scenario 4: Nine segments of CSN, Phase 1

### Scenario 4: Nine segments of CSN, Phase1

#### Assumptions:

163,162 people within CSN catchment (SA2)

5% = 8,158 persons

- Trips per person x 9.4km per trip x 251 weekdays per year) = 73,719,783.32 km cycled
- (3.14 trips per person x 9.4km per trip x 104 weekends per year) = 25,042,318.91 km cycled
- Total anticipated incremental km cycled = 98,762,102.23 km

| Benefits – as per "input items" in TfNSW (2013): | Total anticipated monetised benefit |
|--|-------------------------------------|
| 2.1) Health                                      | \$103,700,207.34                    |
| 2.2) Congestion savings                          | \$28,641,009.65                     |
| 2.3) Roadway Provision cost savings              | \$3,950,484.09                      |
| 2.4) Parking Cost Savings                        | \$1,283,907.33                      |
| 2.5) Vehicle operating cost savings              | \$26,665,767.60                     |
| 2.6) Tolling cost savings                        | n/a                                 |
| 2.7) Noise from cars                             | \$987,621.02                        |
| 2.8) Air pollution from cars                     | \$2,864,100.97                      |
| 2.9) Greenhouse gas emissions                    | \$2,261,652.14                      |
| 2.10) Water pollution                            | \$434,553.25                        |
| <b>Total Benefits per year</b>                   | <b>\$170,789,303.39</b>             |
| <b>Estimated Payback Period</b>                  | <b>2.17 months</b>                  |

| Particulars   | Monetised rates of benefit per km cycled (bicycle km in TfornSW, 2013) | Total benefit for anticipated Km to be cycled on network per year | Total anticipated monetised benefit |
|---|--|---|-------------------------------------|
| <b>Benefits – as per "input items" in TfornSW (2013):</b> |  |   |                                     |
| 2.1) Health   | \$1.050 per km cycled  | \$1.050 x 98,762,102.23   | \$103,700,207.34                    |
| 2.2) Congestion savings                                   | \$0.290 per km cycled  | \$0.290x 98,762,102.23  | \$28,641,009.65                     |
| 2.3) Roadway Provision cost savings                       | \$0.040 per km cycled  | \$0.040 x98,762,102.23  | \$3,950484.09                       |
| 2.4) Parking Cost Savings                                 | \$0.013 per km cycled  | \$0.013x 98,762,102.23  | \$1,283,907.33                      |
| 2.5) Vehicle operating cost savings                       | \$0.270 per km cycled  | \$0.270 x 98,762,102.23   | \$26,665,767.60                     |
| 2.6) Tolling cost savings                                 | \$0.360 per km cycled  | \$0.360x98,762,102.23   | n/a                                 |
| 2.7) Noise from cars                                      | \$0.010 per km cycled  | \$0.010 x98,762,102.23  | \$987,621.02                        |
| 2.8) Air pollution from cars                              | \$0.029 per km cycled  | \$0.029x 98,762,102.23  | \$2,864,100.97                      |
| 2.9) Greenhouse gas emissions                             | \$0.0229 per km cycled   | \$0.0229 x98,762,102.23   | \$2,261652.14                       |
| 2.10) Water pollution                                     | \$0.0044 per km cycled   | \$0.0044x98,762,102.23  | \$434,553.25                        |
| <b>Total Benefits per year</b>                            |  |   | <b>\$170,789,303.39</b>             |

## 9.3 Research Proposal

Construction of the CSN as an intensive active transport infrastructure project provides the opportunity to document the widespread community benefits from such an investment. The CSN is proposing to incorporate a comprehensive Active Travel Research Project research to document and measure the benefits of the investment, which would prove invaluable to other jurisdictions planning to develop networks of their own. Involvement of the Hunter Medical Research Institute and the University of Newcastle in the proposal can ensure that high quality evaluation is built in to the project from the start. The initial research focus areas have been developed focussing on the uptake of cycling in response to new infrastructure, intensive surveillance of safety issues, and changes in community physical activity participation.

There are three research focus areas:

1. Economic and Socio-economic
2. Health
3. Environmental

In order to really understand this number, a combination of research projects is required.

Joining the dots of this research and treating it holistically within an urban planning health context is imperative to understanding the unique Australian context to the global cycling shift. A global economic power with a relatively low population compared to other countries, concentrations of urbanisation on a very large land mass, huge health costs, and a large sedentary population mean that active transport research done overseas needs to be replicated in the Australian setting.

Upon the release of this consultative draft, the CSN steering committee and research partners will look to expand the research group and develop a permanent research body for carrying the research project to an internationally recognised project, though the community group will continue to participate and assist where it can.

**What are the Australian economic benefits?**

**How will this change our health?**

**How many people will cycle?**

**What are the real benefits to businesses?**

### 9.3.1 Economic Research

Predicting the economic benefits of new cycling infrastructure is highly dependant on the degree of uptake, with little available data to assist in making predictions. The analysis of road projects faces the same problem and despite a long history of methods to estimate projected traffic volumes there have been some spectacular failures. Newcastle offers unique opportunities to measure the degree of increased cycling participation due to its topography. The rail lines allow limited crossing points and all trips are funnelled through those points allowing for easy traffic counts and analysis. There is no problem of diverting traffic from adjoining routes. Close evaluation of the CSN will give valuable data for predicting the impact on cycling participation of new infrastructure around Australia, allowing refinement of future benefit:cost calculations.

We expect that the CSN will assist transport equity, a topic that has not previously been examined. Transport disadvantage describes when people are excluded from full participation in society by lack of access to affordable transport. It limits opportunities for employment, education, accessing health services, and reduces social cohesiveness. It commonly affects people who are too young, old or disabled to drive, or who do not have access to a car. Community surveys measuring transport disadvantage will be conducted using the Newcastle Council's Newcastle Voice survey panel, backed up by CATI surveys to ensure a representative sample is reached.

Understanding this strengthens the cost benefit tool standard for bicycle per kilometre benefit and understanding cultural shift.

### 9.3.2 Health Research

Health benefits as mentioned previously offer the greatest potential impact though are the most unknown and hardest to quantify numerically or within a short period of time. Whilst chronic disease outcomes occur after a lag time of years or decades, subjective sensations of wellness, mental health benefits, and improvements to fitness and blood pressure occur within months. This enables suitable research outcome measurements.

Health benefits of the CSN will be measured by a before and after survey design in a number of suburbs as they become connected to the network. Suburbs already connected by cycleways, and suburbs beyond the limits of the network will act as control areas, and those that become connected will be surveyed in the year before construction with repeat surveys one and two years after construction.

Measurements on a random population sample from target areas will include health markers such as blood pressure and obesity, behaviours such as physical activity, and objective measurement of cycling with GPS tracking devices.

Special attention will be paid to cycling by school children, with school based transport audits, and analysis of fitness “beep” tests carried out as part of the PE curriculum. As well as the health focussed research, uptake monitoring will be conducted by embedded bike counting technology, and user attitudes and feedback will be studied through online surveys with participants recruited by attaching invitations to parked bicycles.

### 9.3.3 Environmental Research

The Environmental research component of this report is still being developed. Current areas of investigation for research potential and baseline establishment include:

- Air pollution data available locally
- Congestion hotspots in Newcastle and Lake Macquarie and the availability of air monitoring at those sites

Research around the CSN should include:

- Vehicle reduction on roads
- Types of vehicles reduced on road by those who make the switch from driving to cycling
- Reduced refuse and run-off of motor vehicle pollutants

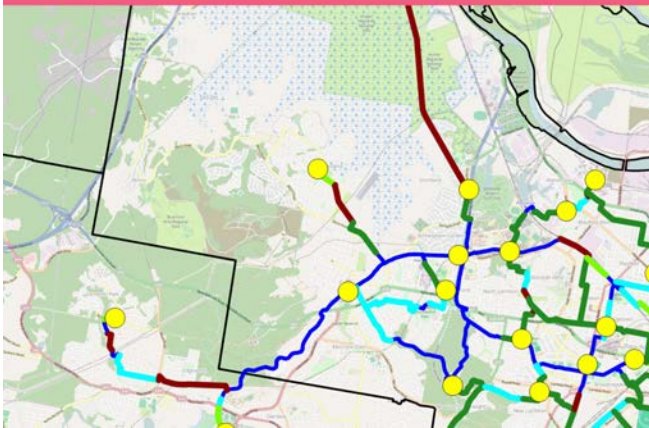
If you have information or know of data available, please contact the CSN steering committee.

# SUMMARY

The CSN proposal offers a great opportunity for the Revitalisation of the Hunter region. It would continue to reap benefits for generations to come, and foster a more healthy, prosperous and connected community.

By developing as a co-ordinated transport infrastructure project, to be delivered in 3 phases over 7 to 10 years, the greatest benefits will be received. In order to achieve this the CSN Project needs to be tasked to a relevant Hunter based Development Authority with a commitment to funding to completion. We believe this is now achievable due to strong community, business and local government support, a source of funding from the lease of the Port of Newcastle and overwhelming evidence of the benefits which can be delivered from implementation of the Project.

The CSN Steering Committee believe that this proposal will be a solid investment for the Hunter.



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